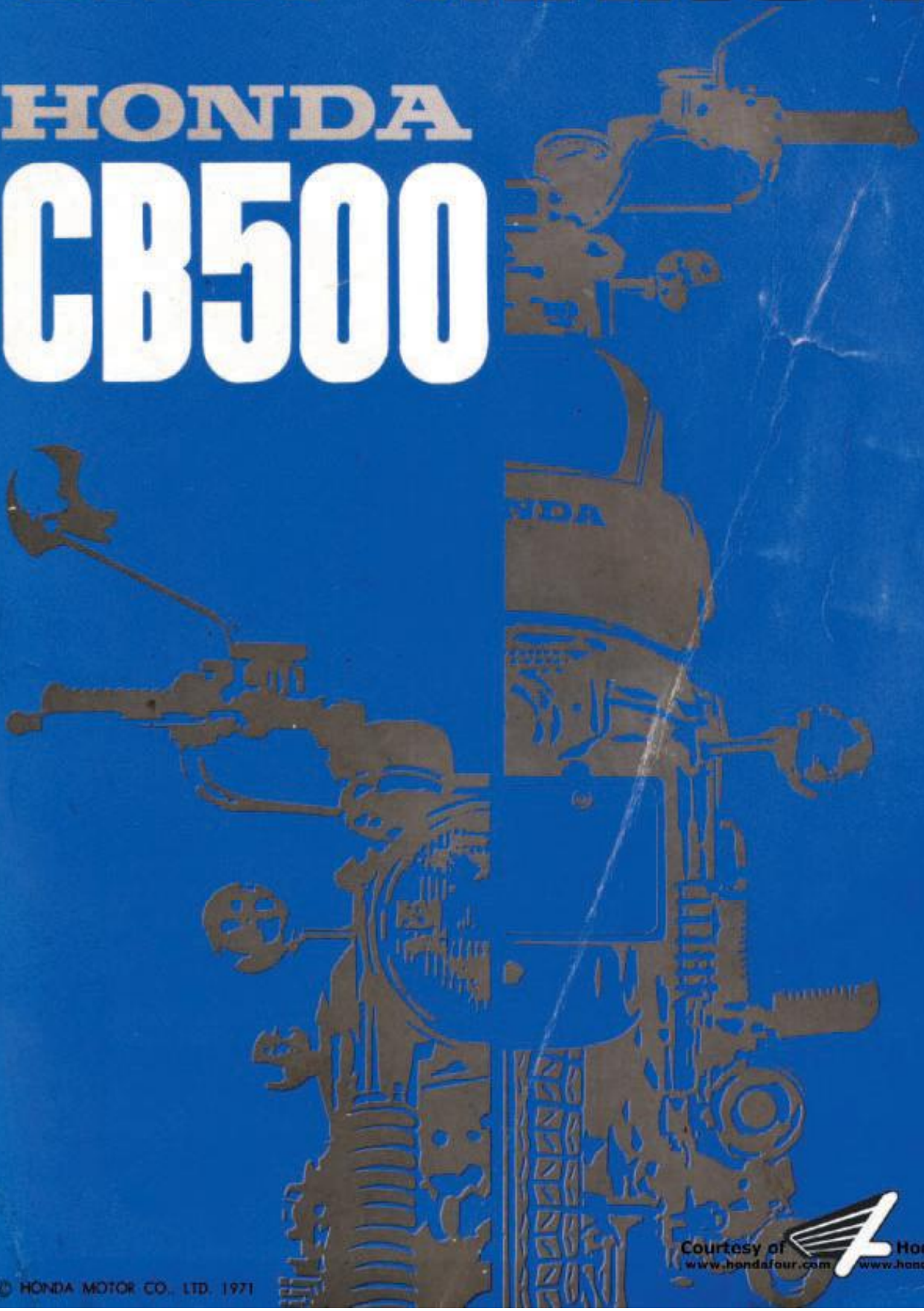
SHOP MANUAL

HONDA

CB500



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PREFACE

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This Shop Manual details the proper servicing and repairing procedures for mechanics working on the HONDA 500, Model CB 500. Carefully reading the complete section before beginning the work and following the steps in the order given will result in better maintenance and repair with less trouble and time consumed.

Always keep the recommended special tools at the work bench when performing repairs.

Use only genuine HONDA replacement parts.

Service data for individual parts is consolidated into a single section at the rear of the text, for quick reference.

The descriptions and specifications in this manual are those in effect at the time this manual was approved for printing.

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HONDA CB500FOUR

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1. REPAIR PROCEDURE

1. When performing an overhaul, all the disassembled parts should be separated in their respective groups so that they will not become mixed.
2. Replace all packings, gaskets and cotter pins with new items when reassembling. Always replace any deformed snap rings with new items.
3. Clean all engine parts after disassembly. Coat friction surfaces of metal parts and bearings with oil.
4. When repairing or replacing the parts, use the recommended special tools for better results.
5. Torque all nuts, bolts and screws, starting with those of large diameter, and from inside to outside symmetrically.
6. Refer to torque values shown in the following table.

ENGINE

	Item	Q'ty	Torque values	
			kg-m	ft-lbs
1.	Tappet adjusting nut	8	1.5-1.7	10.8-12.2
2.	Cam sprocket knock bolt, 7×12	2	1.8-2.0	11.5-14.5
3.	Cylinder head nut, 8mm	12	2.0-2.3	14.5-16.6
4.	A.C. generator rotor set bolt	1	4.0-4.2	28.9-30.3
5.	Starting clutch screw, 8×20 cross flat head screw	3	2.0-2.4	14.5-17.3
6.	Upper crankcase bolt, 8×100 hex bolt	2	2.3-2.5	16.6-18.0
7.	Upper crankcase bolt, 8×125 hex bolt	1	2.3-2.5	16.6-18.0
8.	Lower crankcase bolt, 8×100 hex bolt	10	2.3-2.5	16.6-18.0
9.	Connecting rod nut	8	2.0-2.2	14.5-15.9
10.	Oil pump screw, 6×35 cross flat head screw	5	0.8-1.2	5.7- 8.6
11.	Clutch filter fixing bolt, 6×45 hex bolt	1	0.8-1.2	5.7- 8.6
12.	Spark advancer bolt, 6×55 hex bolt	1	0.8-1.2	5.7- 8.6
13.	Tachometer gear holder screw, 6×16 cross flat head screw	1	1.0-1.4	7.2-10.1
14.	Exhaust pipe flange nut, 6mm	8	0.8-1.2	5.7- 8.6
15.	Oil pressure switch	1	1.5-2.0	10.8-14.5
16.	Gear shift lever bolt, 6×20 hex bolt	1	0.8-1.0	5.7- 7.2
17.	Oil filter center bolt	1	2.7-3.3	19.5-23.8
18.	Spark plug	4	1.2-1.6	8.6-11.6
19.	Oil drain bolt	1	3.5-4.0	25.3-28.9
20.	Clutch spring, 6×20 hex bolt		0.8-1.2	5.7-8.6
21.	Exhaust flange, 6mm nut	8	0.8-1.2	5.7-8.6
22.	Oil filter center bolt	1	2.7-3.3	19.5-23.8
23.	Tappet hole cap	8	1.0-1.4	7.2-10.1
24.	Oil path cap	1	1.0-1.4	7.2-10.1
25.	Gear shift return spring, 8mm bolt	1	2.0-3.0	14.5-21.7
Standard parts				
	Bolt hex. 6mm		0.8-1.2	5.7- 8.6
	Bolt hex. 8mm		2.0-2.4	14.5-17.3
	Screw cross, 6mm		0.8-1.2	5.7- 8.6

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CHASSIS

	Item	Q'ty	Torque values	
			kg-m	ft-lbs
1.	Rear brake pedal bolt, 8×32 hex holt	1	1.8–2.5	13.0–18.1
2.	Step bar nut. 12mm	2	5.0–6.0	36.2–43.4
3.	Engine hanger bolt A	5	3.0–4.0	21.7–28.9
4.	Engine hanger plate	6	1.8–2.5	13.0–18.1
5.	Rear fork pivot nut, 14mm	1	5.5–7.0	39.8–50.6
6.	Rear suspension upper nut, 10mm cap nut	2	3.0–4.0	21.7–28.9
7.	Rear suspension lower bolt, 10×32 hex bolt	2	3.0–4.0	21.7–28.9
	Front brake			
8.	Oil bolt	3	3.4–4.0	24.6–28.9
9.	Brake stop switch	1	3.4–4.0	24.6–28.9
10.	Front brake disc nut, 8mm	6	1.8–2.3	13.0–16.6
11.	Brake oil joint, 6×28 hex bolt	1	0.8–1.0	5.8– 7.2
12.	Brake hose joint	1	0.6–1.0	4.3– 7.2
13.	Master cylinder bolt, 6×28 hex bolt	2	0.8–1.0	5.7– 7.2
14.	Caliper set bolt	2	3.4–4.0	24.6–28.9
15.	Holder joint bolt, 8×40, 8×50 hex bolt	3	1.8–2.3	13.0–16.6
16.	Front fork bolt	2	5.5–6.5	39.8–47.0
17.	Steering stem nut	1	8.0–12.0	57.9–86.7
18.	Steering stem bolt, 10×40 hex bolt	2	3.0–4.0	21.7–28.9
19.	Rear wheel axle nut	1	8.0–10.0	57.8–72.3
20.	Front axle holder nut, 8mm	4	1.8–2.3	13.0–16.6
21.	Handlebar holder bolt, 8×40 hex bolt	4	1.8–2.3	13.0–16.6
22.	Front wheel axle nut	1	5.5–6.5	39.8–47.0
23.	Rear brake stopper arm bolt and nut, 8mm	1	1.8–2.3	13.0–16.6
24.	Fork top bridge bolt, 8×56 hex bolt	2	1.8–2.3	13.0–16.6
25.	Drive chain adjuster bolt and nut, 8mm hex bolt	2	1.5–2.0	10.8–14.5
26.	Drive chain adjuster stopper bolt	2	1.8–2.3	13.0–16.6
27.	Main stand pivot pipe bolt, 8×40 hex bolt	2	1.5–2.0	10.8–14.5
28.	Pillion step nut, 12mm	2	4.5–6.0	32.5–43.4
29.	Caliper joint pin	1	1.8–2.5	13.0–18.1
30.	Bottom bridge	2	3.0–4.0	21.7–28.9
31.	Final driven sprocket	4	3.0–4.0	21.7–28.9
	Standard parts			
	Bolt hex. 6mm		0.8–1.2	5.8– 8.7
	Bolt hex. 8mm		1.5–2.3	10.8–16.6

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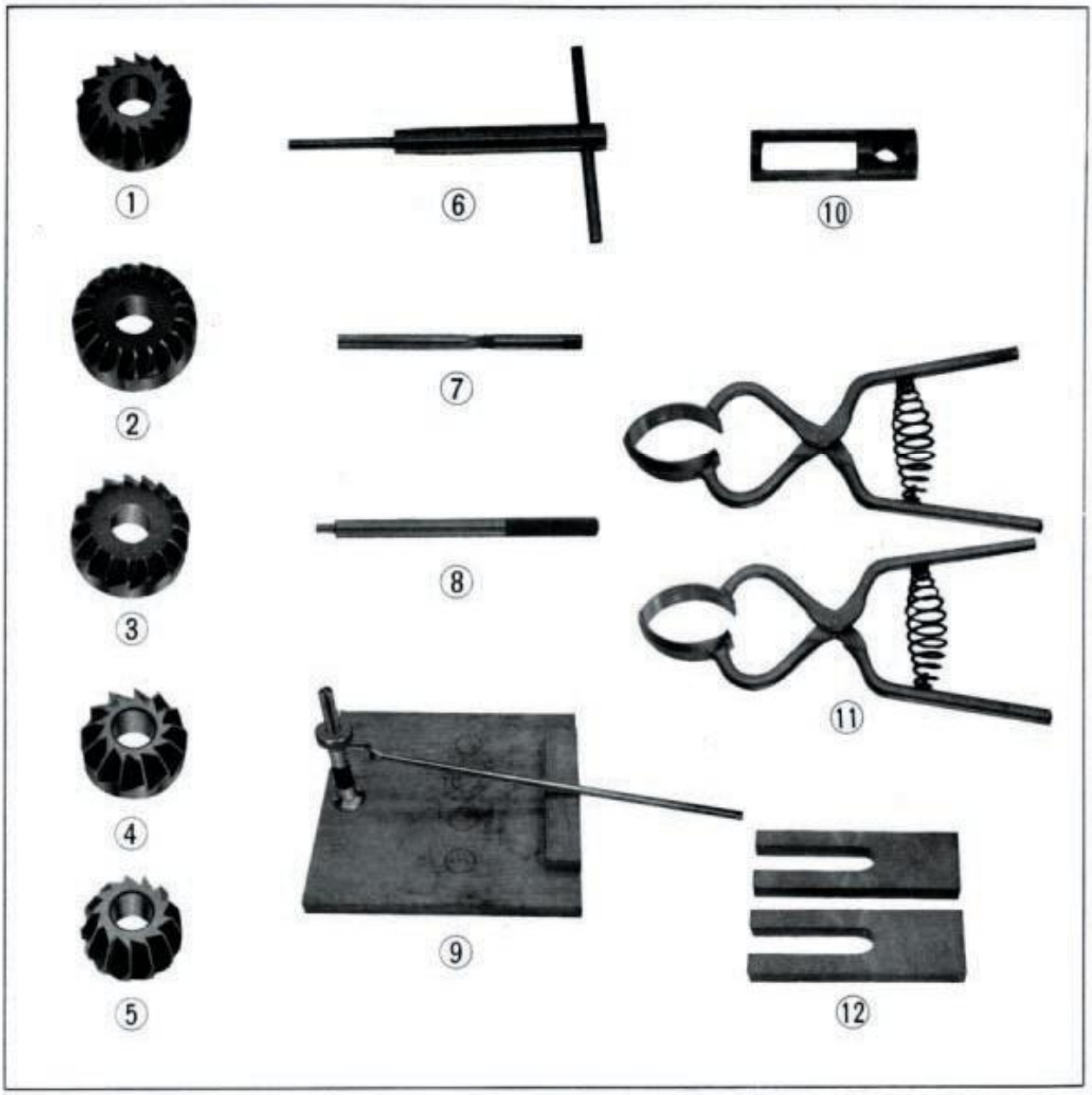
2. SPECIAL TOOLS



Ref. No.	Tool No.	Description
	07000-32301	Special Tool Set for CB 500
①	07001-32301	Valve seat 90° cutter
②	07003-32301	Inlet valve seat top cutter
③	07004-32301	Exhaust valve seat top cutter
④	07005-32301	Inlet valve seat interior cutter
⑤	07006-32301	Exhaust valve seat interior cutter
⑥	07007-32301	Valve seat cutter holder
⑦	07008-32301	Valve guide reamer
⑧	07046-32301	Valve guide driving and removing tool
⑨	07031-30011	Valve spring compressor
⑩	07031-32301	Valve spring compressor attachment
⑪	07032-32301	Piston ring compressor (2 pcs)
⑫	07033-55101	Piston base (2 pcs)
—	07001-32301	Valve seat cutter set
—	07997-05101	Valve seat cutter case

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Ref. No.	Tool No.	Description
⑭	07081-32301	Valve tappet lock nut wrench
⑮	07087-32301	Carburetor synchronization adjusting wrench
⑯	07078-32301	12 mm cylinder head nut wrench
⑰	07094-32301	Spark plug wrench
⑱	07011-21601	AC generator rotor puller
⑲	07009-32301	Sliding hammer shaft (primary shaft remover)
⑳	07009-32305	Sliding weight
㉑	07073-32301	Master cylinder snap ring pliers
㉒	07043-32301	Piston cup guide
㉓	07072-20001	48 mm steering stem top thread wrench
㉔	07085-32301	6 mm fork bottom case bolt wrench
—	07043-32305	Master cylinder piston guide

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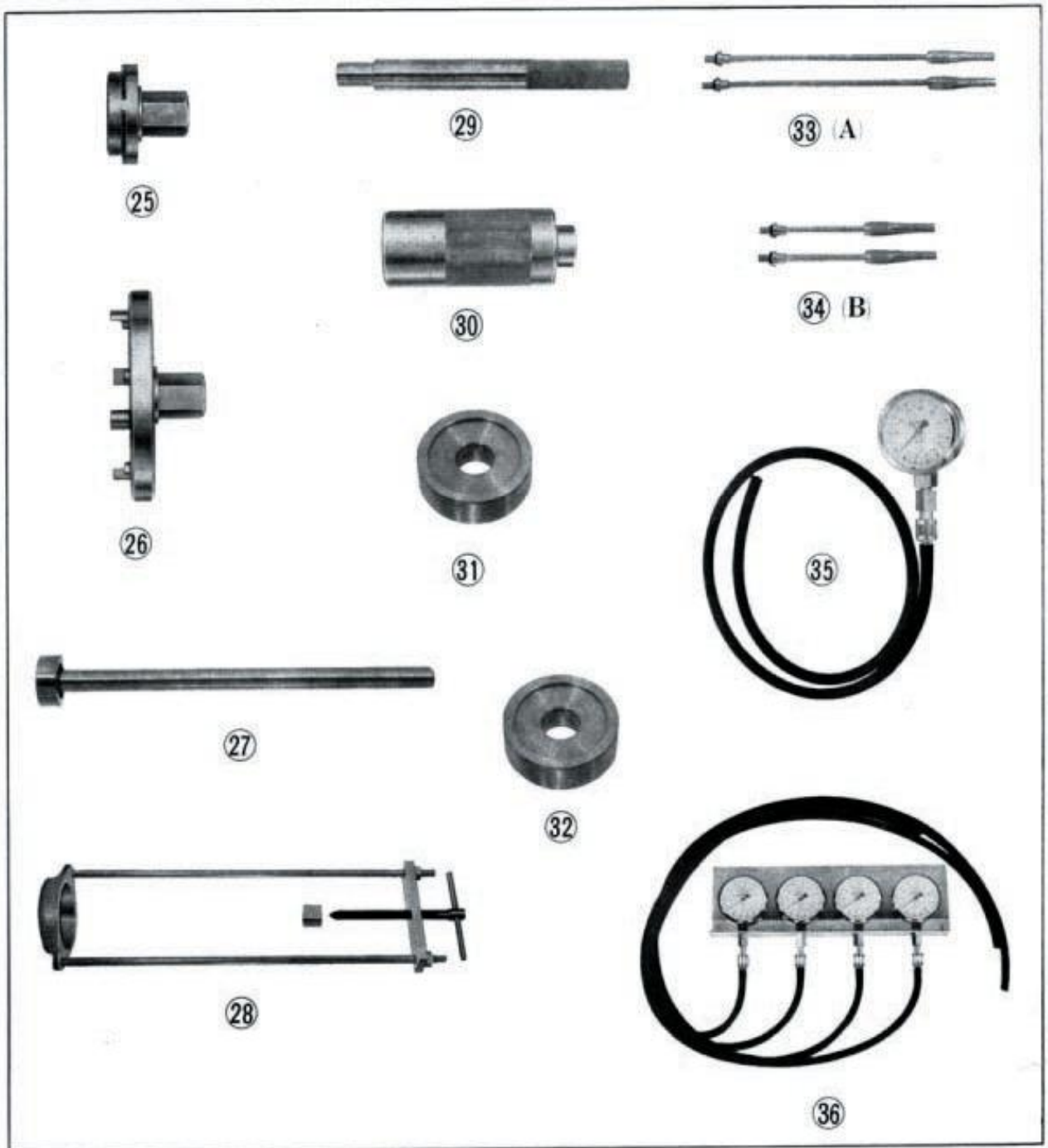

Ref. No.	Tool No.	Description
㉕	07088-32301	Bearing retainer wrench A (front)
㉖	07088-32305	Bearing retainer wrench B (rear)
㉗	07034-32301	Front fork assembling bar
㉘	07035-30001	Rear cushion disassembling and assembling tool
㉙	07048-32301	Bearing driver A
㉚	07048-32320	Bearing driver B
㉛	07048-32305	Bearing driver attachment A
㉜	07048-32315	Bearing driver attachment B
㉝	07068-30007	Vacuum gauge attachment (A) (2 pcs)
㉞	07068-30010	Vacuum gauge attachment (B) (2 pcs)
㉟	07064-30012	Vacuum gauge (1 pcs)
㊱	07064-30001	Vacuum gauge set
—	07790-29201	Tool case
—	07065-30001	Pressure gauge
—	07068-30001	Oil pressure gauge attachment

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3. MAINTENANCE OPERATIONS

1. TAPPET ADJUSTMENT

Adjust tappet clearance when the engine is cold.

1. Remove the tank.
2. Unscrew the tappet hole caps.
3. Remove the point cover and align the "T" (1·4) mark on the spark advancer to the timing mark when the No. 1 piston (pistons are numbered from left to right from the rider's position) is at top-dead-center of the compression stroke.
4. Then check and adjust valve tappet clearances indicated by "O" in the chart below.
5. Measure the clearances using a feeler gauge, adjust by loosening the lock nut and turning the adjuster screw, and tighten the lock nut.
   Valve tappet clearances:
   INLET ——— **0.05 mm (0.002 in.)**
   EXHAUST — **0.08 mm (0.003 in.)**
6. Next, rotate the crankshaft one revolution and realign the "T" (1·4) mark on the spark advancer to the timing mark (in this position, the No. 4 piston is at top-dead-center of the compression stroke). Then check and adjust the valve tappet clearances indicated by "X" in the chart below. See item 5 above for proper valve tappet clearances.

	No. 1 cylinder	No. 2 cylinder	No. 3 cylinder	No. 4 cylinder
Inlet valve	O	X	O	X
Exhaust valve	O	O	X	X

Note:

- **Hold the adjusting screw so that it is not turned when tightening the lock nut.**
- **Make sure the clearance is not disturbed when the lock nut is tightened.**

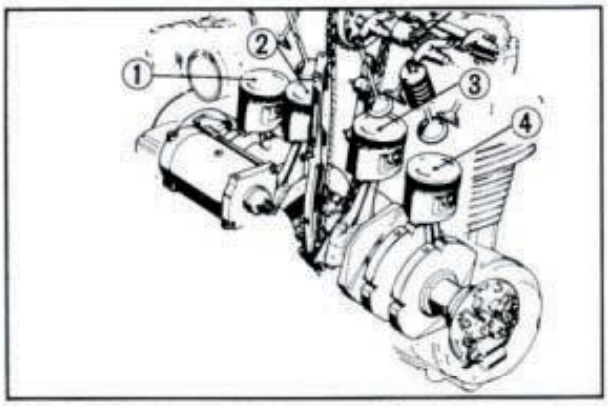

Fig. 1 ① No. 1 piston ③ No. 3 piston
② No. 2 piston ④ No. 4 piston

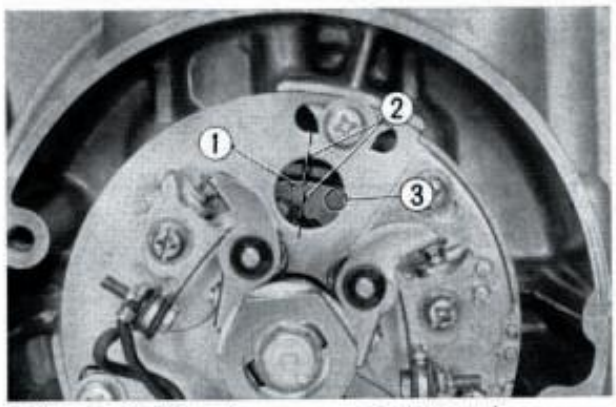

Fig. 2 ① T mark ③ 1·4 mark
② Timing mark

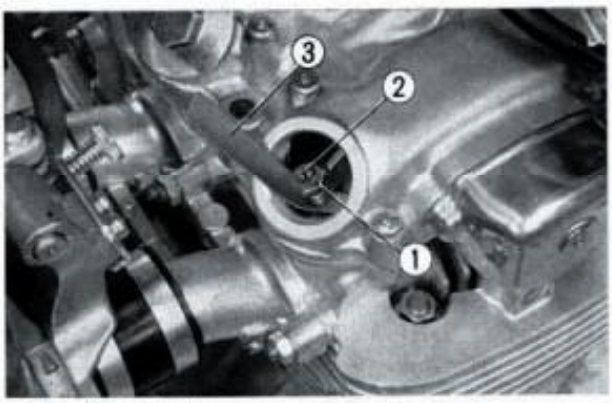

Fig. 3 ① Lock nut ③ Feeler gauge
② Adjusting screw

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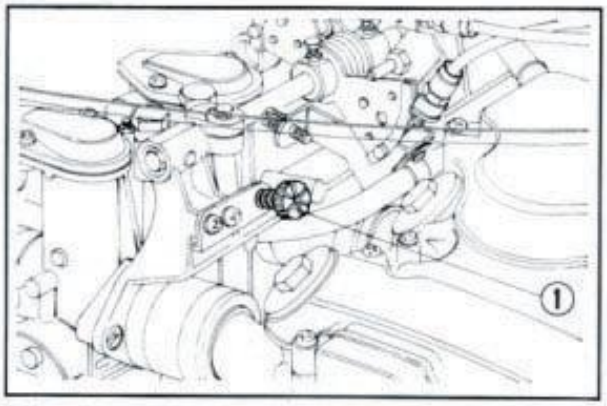

Fig. 4 ① Throttle stop screw

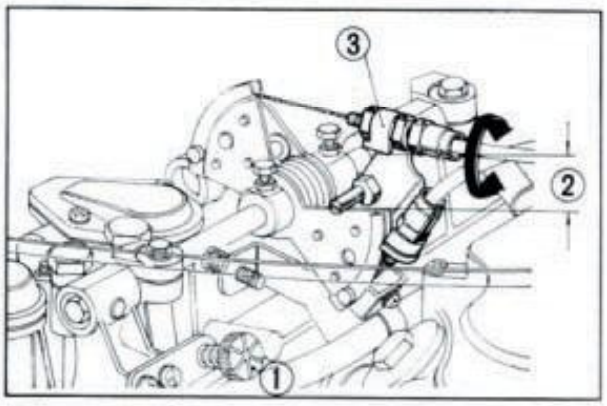

Fig. 5 ① Throttle stop screw
② 49±1.5 mm (1.929±0.059 in.)
③ Stay

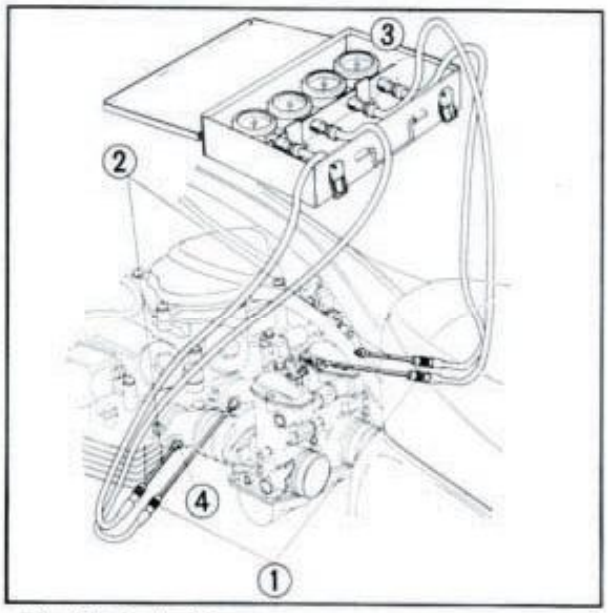

Fig. 6 ① A adaptor
② B adaptor
③ Vacuum gauge
④ Plug hole

2. CARBURETOR ADJUSTMENT

Adjust the carburetor after warming up the engine (60-70°C/140-158°F Temp).

Idle adjustment

Adjust the engine idle speed to **950-1050** rpm with the throttle stop screw. Turn the screw clockwise to increase the idle speed and counterclockwise to decrease the idle speed.

Synchronization adjustment

1. Remove the fuel tank.

   Note:
   Position the tank about 50 cm (20 in.) higher than the mounting position and reconnect with a longer fuel tube.
2. Adjust the throttle stop screw so that the throttle lever is **49±1.5 mm** (**1 15/16 ± 1/16 in.**) from the stay.
3. Install the vacuum gauge in the inlet manifolds. Remove the plugs from the inlet manifolds. Install the longer A adaptors of the vacuum gauge to the two inside manifolds and the shorter B adaptors to the outside manifolds.
4. Start the engine, loosen the adjusting lock nuts and turn the adjusting screws so that all four carburetors are indicating uniformly (**16-24 cm Hg**) on the vacuum gauge.

   Turn the screw clockwise to decrease vacuum pressure. Turn the screw counterclockwise to increase vacuum pressure.

   All the carburetors should be adjusted to within **3.0 cm Hg** of each other.

Note:
If the gauge needle is oscillating over a wide range, dampen the movement with the vacuum adjuster on the gauge.

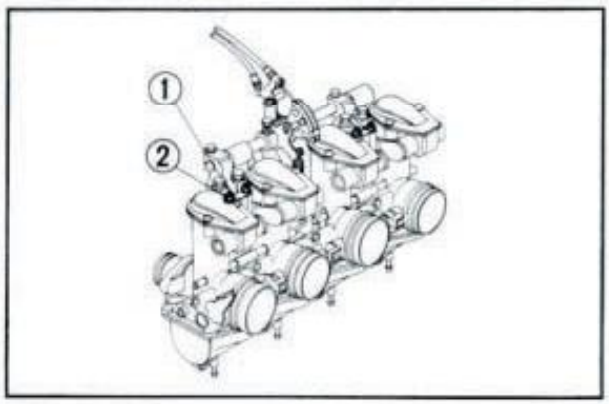

Fig. 7 ① Screw
② Lock nut

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5. Snap the throttle several times and recheck vacuum pressures after the four carburetors are indicating the same vacuum pressure.
   Repeat the adjustment in item 4 if vacuum pressures lack uniformity.
   Check the following items if vacuum pressure is less than **15 cm Hg** for any of the carburetor:
   1. Be sure the ignition timing is **−5°/1,150−30°/2,500 rpm BTDC.**
   2. Check the tappet clearances.
      Inlet: **0.05mm (0.002 in.)**
      Exhaust: **0.08mm (0.003 in.)**
   3. Check the spark plug gap.
      Gap: **0.6–0.7 mm (0.024–0.028 in.)**
   4. Check the compression pressure.
      Pressure: **11–12 kg/cm² (156.45–170.67 psi.)**
6. Adjust the throttle stop screw to an engine idle speed of **950~1,050 rpm** after all four carburetors have been adjusted to the same vacuum pressure.
7. Adjust the air screw on each carburetor. (the standard adjustment for the air screws is **1±3/8** turn open from the complete close position)
8. Readjust the engine idle speed to **950 −1,050** rpm with the throttle stop screw.

Note:
Tighten the plugs in the inlet manifold after performing the carburetor synchronization.

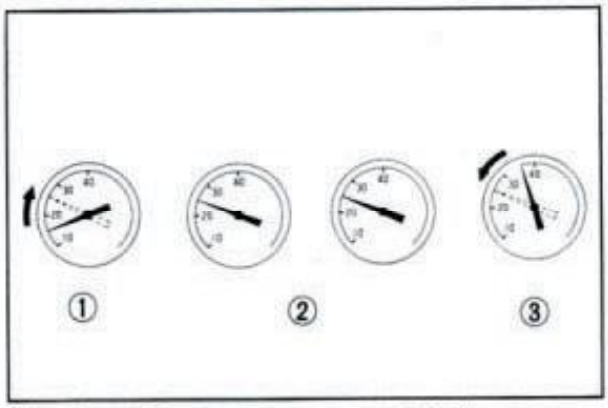

Fig. 8 ① Low vacuum ② Normal ③ High vacuum

Throttle Cable Adjustment

1. Turn the adjuster counterclockwise at the handle bar end to increase play in the throttle cable.

Note:
Leave about 3 mm (0.12 in) range of adjustment at the cable adjuster for final micro-adjustment.

2. Loosen the cable lock nut and turn the adjuster at the carburetor end to provide **3~4 mm** (1/8~5/32 **in.**) play at the throttle grip flange.

Note:
The throttle lever should hit the eccentric pin when the grip is forced to the full closed position. Replace the return cable with new one if it does not hit.

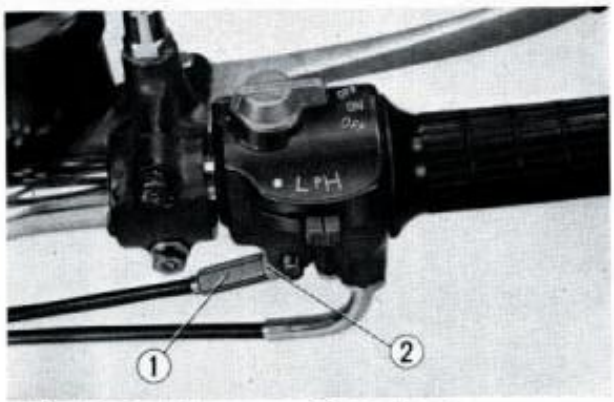

Fig. 9 ① Adjuster ② Lock nut

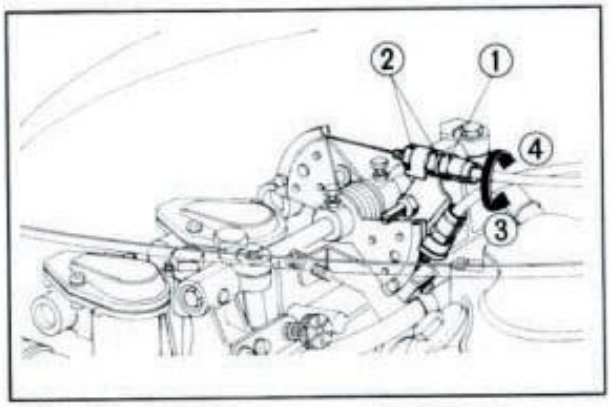

Fig. 10 ① Adjuster ② Lock nut ③ Decrease ④ Increase

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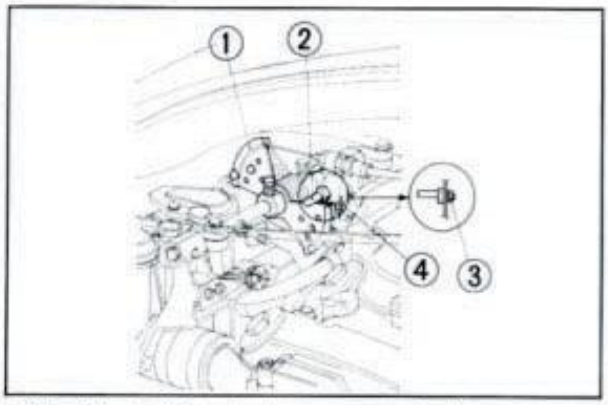

Fig. 11 ① Throttle lever ③ Lock nut ② Eccentric pin ④ 2~3 mm (0.08~0.12 in.)

Overtravel stopper adjustment

Loosen the lock nut and turn the eccentric pin. Clearance between the throttle lever and the eccentric pin should be **2~3 mm (0.08~0.12 in)**.

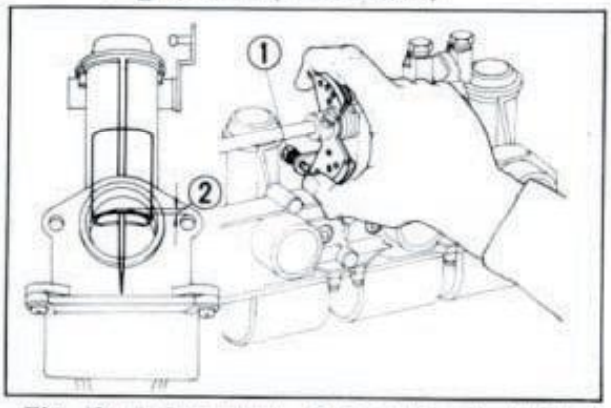

Fig. 12 ① Stop screw ② 0~1.0 mm (0~0.04 in.)

Full throttle opening stopper adjustment

Adjust the stop screw so that the throttle valve extends **0~1.0 mm (0~0.04 in.)** above the throttle bore in the full open position.

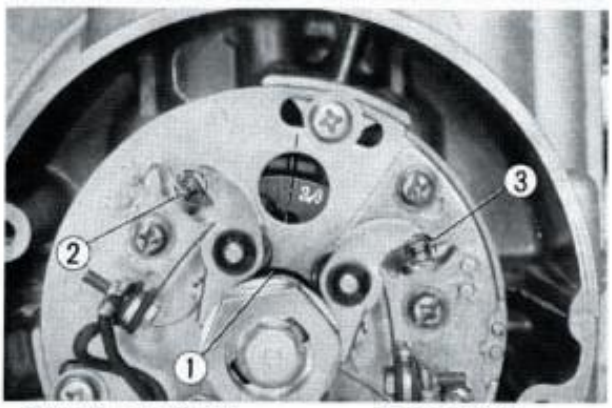

Fig. 13 ① Slipper ③ 2·3 points ② 1·4 points

3. BREAKER POINT GAP AND IGNITION TIMING ADJUSTMENT

Check the condition of the contact points, point gap and ignition timing. Adjust the ignition timing of the 1·4 points first.

Breaker point gap adjustment, 1·4 points

1. Rotate the crankshaft until the slipper on the contact breaker is coming up on the highest position of the cam lobe. Measure the point gap with a feeler gauge. Standard point gap : **0.3~0.4 mm (0.012~0.016 in.)**
2. Loosen screw ⓐ and move the breaker point assembly if it is necessary to adjust.

Breaker point gap adjustment, 2·3 points

Adjust the 2·3 point gap in the same manner as for 1·4 points by loosening screw ⓑ.

Note:

Clean the point surfaces with a point file or oil stone if they are pitted or rough.

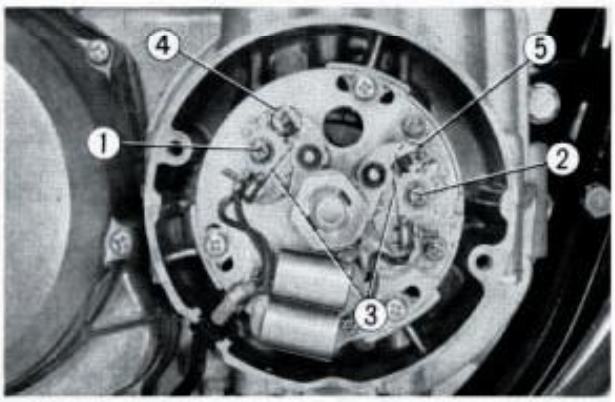

Fig. 14 ① Screw ⓐ ③ Breaker ⑤ 2·3 points ② Screw ⓑ ④ 1·4 points

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Ignition timing adjustment, 1·4 points

1. Disconnect the primary cord (blue cord) to the contact breaker at the connector and connect a 12V test lamp at this point.
2. Turn the main switch to the ON position.
3. Rotate the crankshaft slowly. If the test lamp comes on when the "F" (1·4) mark on the spark advancer is aligned to the timing mark (5° BTDC.), the timing is correct.
4. If the adjustment is necessary, align the "F" (1·4) mark to the timing mark and loosen screw ⓑ, and then move the base ⓑ until the lamp goes out. Tighten the screw.

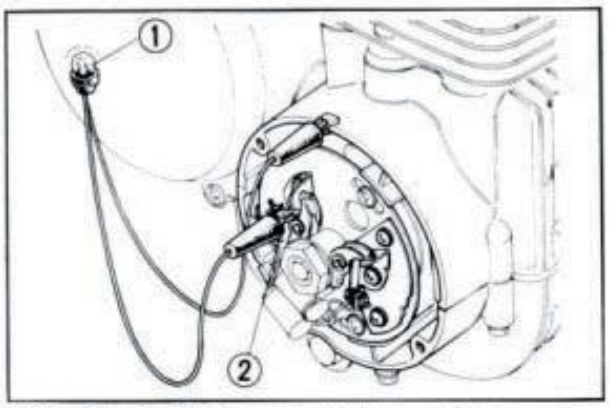

Fig. 15 ① 12V lamp ② Blue cord

Ignition timing adjustment, 2·3 points

1. Connect the 12V test lamp to the primary cord (yellow cord) of the opposite contact breaker and align the "F" (2·3) mark to the timing mark.
2. Loosen screw ⓒ and move base ⓒ as shown above.

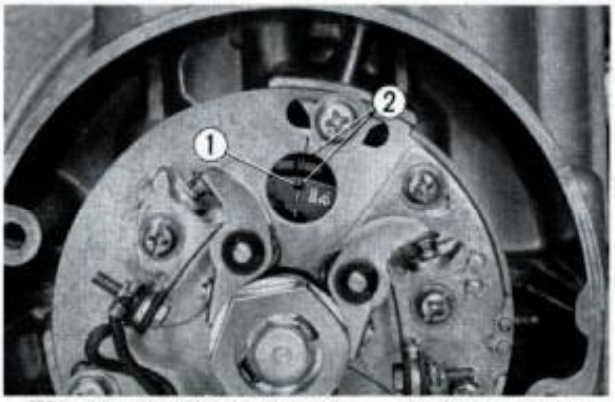

Fig. 16 ① "F" (1·4) mark ② Timing mark

Ignition timing adjustment with stroboscopic timing light

The use of the stroboscopic timing light is recommended to obtain the most accurate timing.

1. Plug the timing light cord into the timing light receptacle.
2. Remove the spark plug cap from the No. 1 cylinder and install the timing attachment between the spark plug and the cap.
3. Connect the high tension cord of the timing light to the timing attachment, position the switch knob to TIMING, and start the engine.
   The timing light will be flashing.
4. Aim the timing light toward the timing mark and make sure the "F" (1·4) mark and the timing mark are in line.
   Next, increase the engine rpm at approx. 2500 rpm and at this speed, if the timing mark is between the two index lines located 23.5~26.5° before "F" mark, the ignition timing at full advance condition is satisfactory.

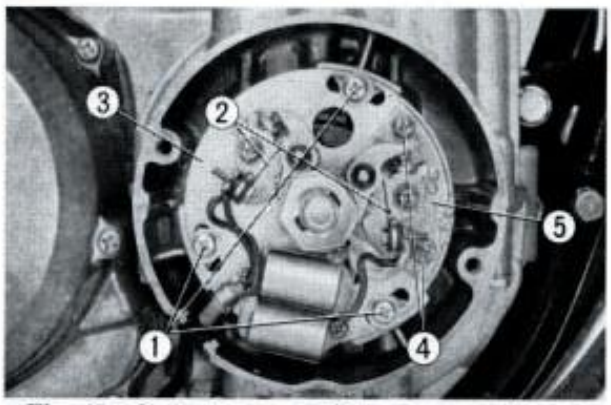

Fig. 17 ① Screw ⓑ ③ Base ⓑ ⑤ Base ⓒ
② Breaker ④ Screw ⓒ

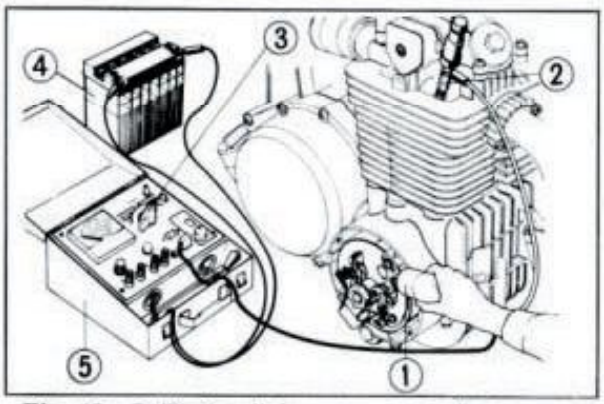

Fig. 18 ① Timing light ④ Battery
② Timing attachment ⑤ Service tester
③ Switch knob

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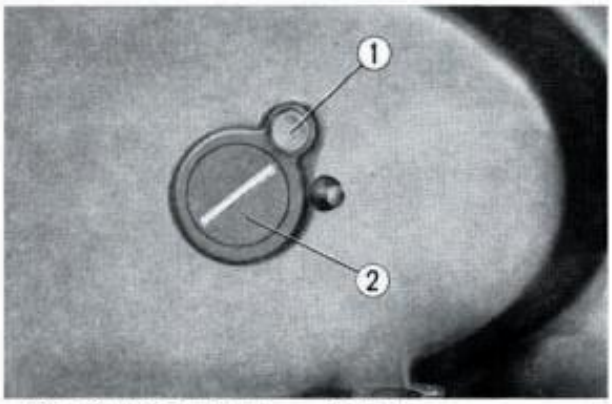

Fig. 19 ① Lock bolt ② Adjuster

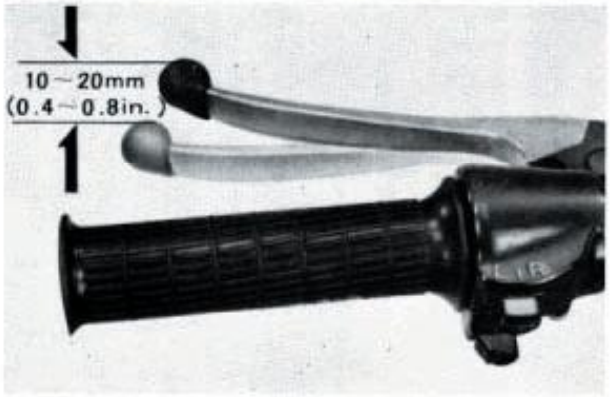

Fig. 20

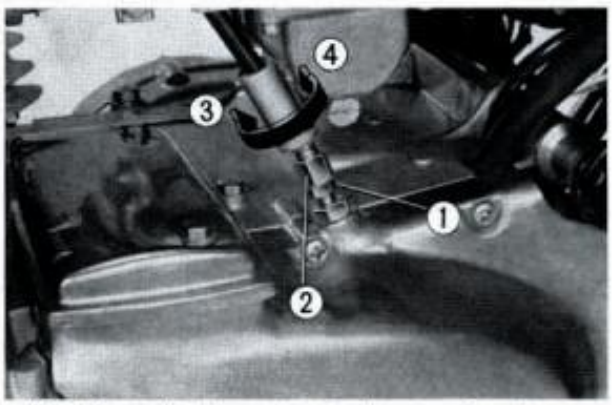

Fig. 21 ① Lock nut ③ Increase free play
② Adjuster ④ Decrease free play

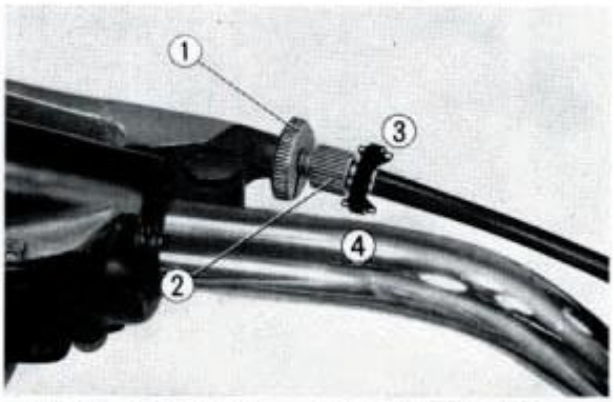

Fig. 22 ① Lock nut ③ Increase free play
② Adjuster ④ Decrease free play

5. Next, remove the spark plug cap from the No. 2 cylinder and install the timing attachment between the spark plug and the cap. Check the ignition timing ("F" 2·3) as described items 1~4.
6. Adjust if timing is incorrect.

4. CLUTCH ADJUSTMENT

1. To provide play in the clutch cable, loosen the clutch adjuster lock bolt.
2. Turn the adjuster clockwise until a slight resistance is felt, and then turn counter-clockwise about **3 mm** (1/8 **in.**). At that point, tighten the lock bolt.
3. Adjust play in the clutch cable at the lock nut and adjuster. The play should be **10~20 mm** (**0.4~0.8 in.**). Perform micro adjustment with the adjuster at the clutch lever end.

5. CAM CHAIN ADJUSTMENTS

Perform camchain tention adjustment in the following manner.

1. Remove the tappet hole caps from the No. 1 cylinder.
2. Remove the point cover, and align the "T" (1·4) mark to the timing mark.
3. Check both valves of No. 1 cylinder. If both valves are free, proceed to next step; if either or both of the valves are

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tight, rotate the crankshaft 360°, and then proceed with the next step.

4. Rotate the crankshaft clockwise until the spring peg on the advancer assembly at the 1·4 position is just to the right of a line from the timing mark. This position is 15° ATDC.
5. At this point, loosen the lock nut so that proper chain tension can be obtained automatically.
6. Retighten the lock nut, and re-install point cover and tappet covers.

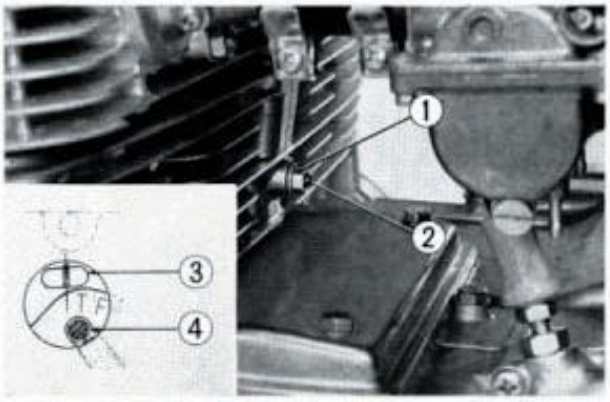

Fig. 23 ① Nut ② Adjusting screw ③ Timing mark ④ Spring peg

6. SPARK PLUG INSPECTION

Remove the spark plug with a spark plug wrench and check the gap and the insulator for damage or fouling.

1. Clean the plug with a spark plug cleaner or a wire brush.
2. Check the gap with a feeler gauge and adjust the opening to the standard **0.6~0.7 mm (0.02~0.03 in).**
3. Replace the plug or plug gasket if the insulator or gasket is damaged.

Standard spark plugs: **D-7ES (NGK)**
X22ES (DENSO)

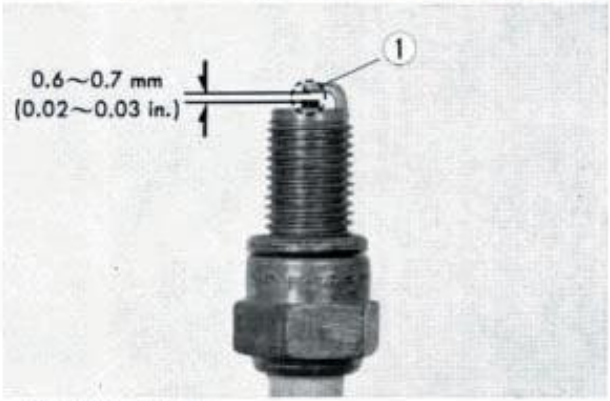

Fig. 24 ① Gap

7. ENGINE OIL INSPECTION AND CHANGE

Oil Level Inspection

Check the oil level with the dipstick gauge without screwing it into the case. If the level is below the lower mark on the gauge, add oil to the upper mark.

Recommended oil classification:

SAE 10W-40 or SAE 20W-50

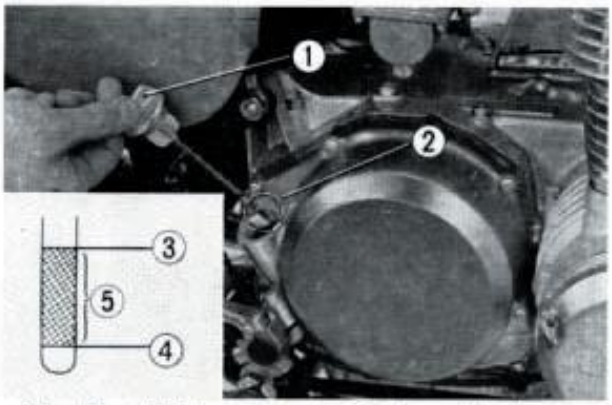

Fig. 25 ① Filler cap ② Oil level gauge ③ Upper level ④ Lower level ⑤ Serviceable range

Oil change

Perform the oil change while the engine is warm so that oil will drain properly.

1. Unscrew the drain bolt, and also remove the filler cap to assist draining.
2. Remove the oil filter to drain the oil completely.
3. Tighten the drain bolt and fill with **2.5 l (2.6 U.S. qt., 2.2 Imp. qt.)** of new oil through the filler opening. Add oil as necessary to bring the oil level to the upper mark on the gauge.

Oil capacity: **3.0 liters (3.2 U.S. qt., 2.6 Imp. qt.)**

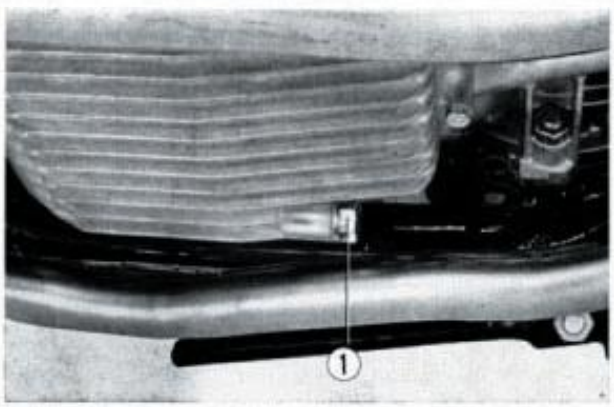

Fig. 26 ① Drain bolt

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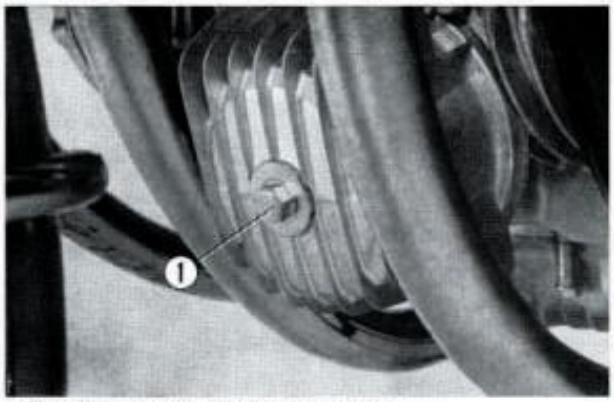

Fig. 27 ① Oil filter center bolt

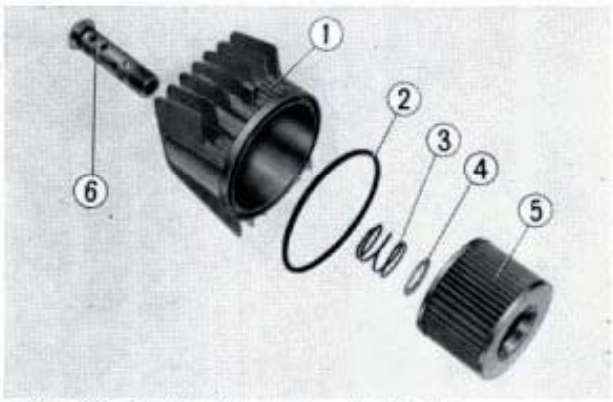

Fig. 28 ① Oil filter cover ④ Washer
② O ring ⑤ Oil filter element
③ Spring ⑥ Oil filter center bolt

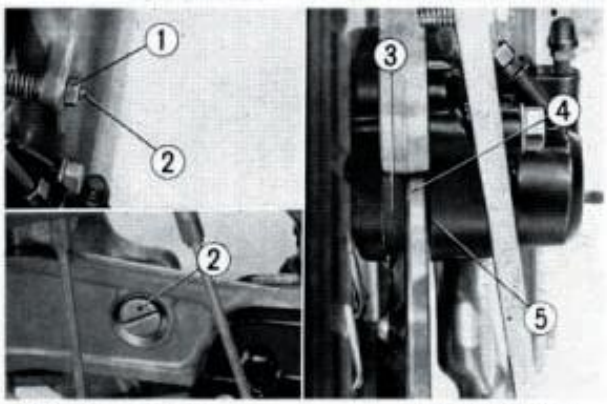

Fig. 29 ① Nut ④ Brake disc
② Caliper adjusting bolt ⑤ Pad A
③ Pad B

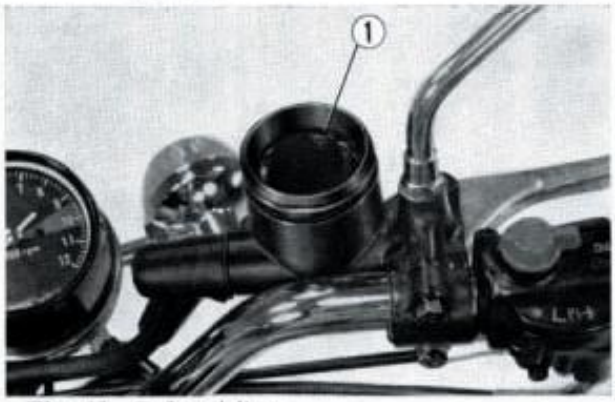

Fig. 30 ① Level line

8. OIL FILTER SERVICING

Service the oil filter when changing the engine oil.

1. Unscrew the oil filter center bolt and remove the filter element.

Note:

- **Certain amount of oil will drip from the filter when it is removed.**
- **When reinstalling the element, make sure that no parts are forgotten or pieces of rubber left on the seat to cause poor sealing.**
- **Replace the oil filter element with new item every 4,000 miles (6,000 km).**

9. BRAKE INSPECTION AND ADJUSTMENT

Caliper Return Travel Adjustment

1. Loosen the nut and turn the caliper adjusting bolt counterclockwise until the pad B lightly contacts the brake disc. (To decrease clearance, the adjusting bolt is turned clockwise from right side of bike, or counterclockwise from left side of bike.)
2. Turn the bolt clockwise 1/3 to 1/2 turn from this point and tighten the lock nut.

Note:

Raise the front wheel off the ground and spin the wheel by hand to check for brake drag. Slight drag is acceptable.

Brake Fluid Level Inspection

1. Remove the cap on the master cylinder and make sure that the fluid is up to the level line on the reservoir.
2. Add brake fluid if the level is low or change the fluid if excessively dirty.
   Recommended brake fluid:
   SAE J 1703 a BRAKE FLUID

Note:

- **Do not mix different brands of brake fluid as chemical action will take place and may cause brake trouble.**
- **Do not use any other fluid in the brake system.**

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· **Remove any brake fluid which may become spilled on the painted surface, rubber parts, and meter as it will produce chemical action and cause damage to these parts.**

Brake Pad Inspection

Replace both pads A and B with new one when either of the pads is worn to the red serviceable limit mark aroung the pad.

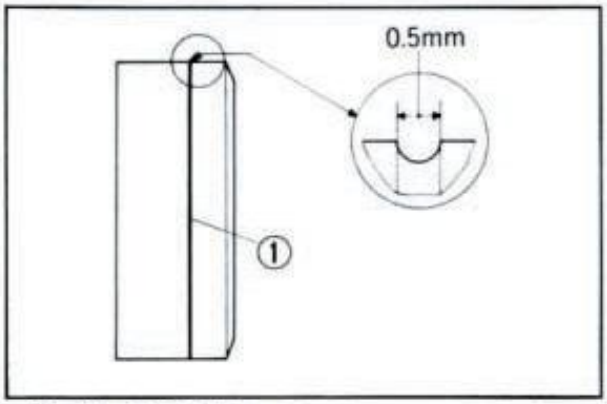

Fig. 31 ① Red line

Brake Bleeding

Bleed brakes to remove the air from the brake system when the brake lever action feels spongy.

1. Fill the reservoir of the master cylinder with brake fluid to the height of the level line.
2. Connect a hose to the bleeder on the caliper and prepare a vessel to catch the fluid.
3. Pump the brake lever several time until pressure can be felt. With the brake lever held against the pressure, open the bleeder about half a turn, and when the lever bottoms against the handle bar, immediately close the bleeder. Repeat this operation several times until air bubbles no longer flow out with the fluid from the bleeder hose.

Note:

The fluid in the reservoir must be replenished and not be allowed to become exhausted during the bleeding operation.

· The reservoir must be capped when pumping the brake lever.

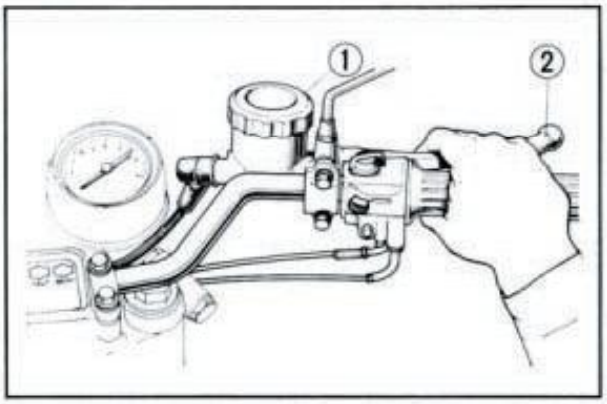

Fig. 32 ① Brake fluid reservoir ② Brake lever

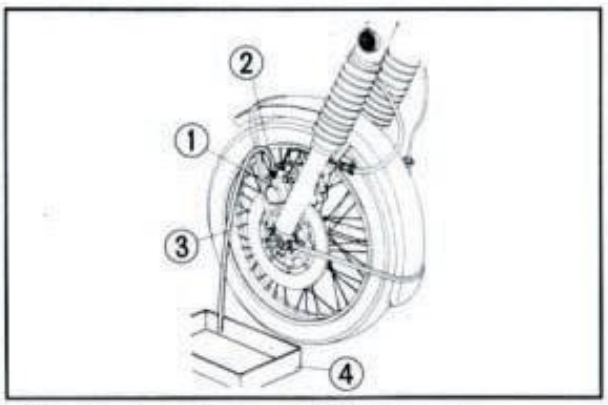

Fig. 33 ① Caliper ③ Bleeder hose
② Bleeder ④ Vessel

Rear Brake Adjustment

1. Normal play at the end of the brake pedal is **2-3 cm** ($^{3}/_{4}$~$1^{3}/_{16}$ **in.**).

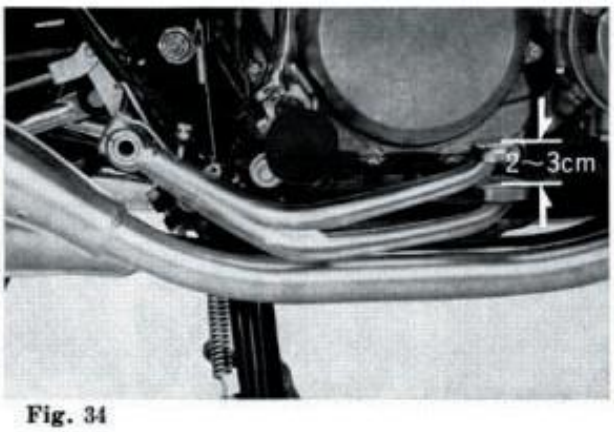

Fig. 34

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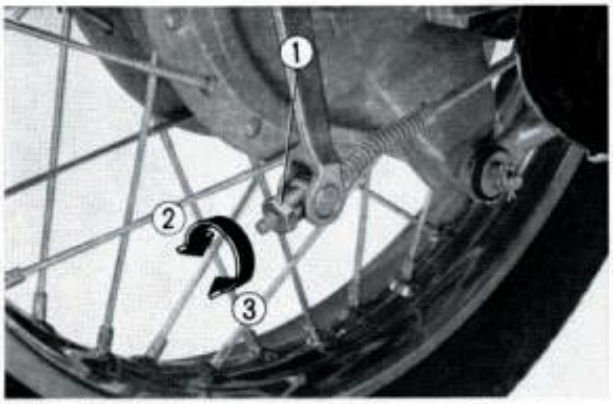

Fig. 35 ① Adjuster nut ③ Decrease free play ② Increase free play

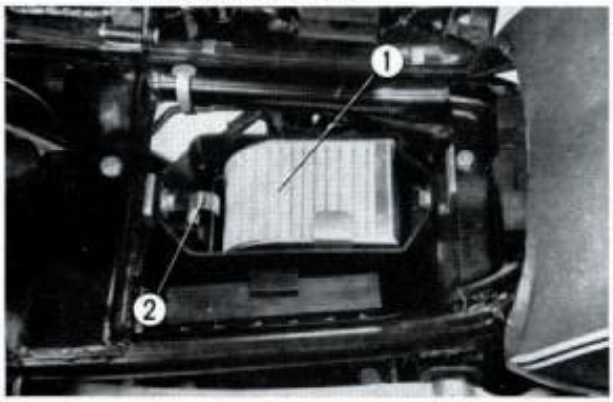

Fig. 37 ① Air cleaner element ② Spring clip

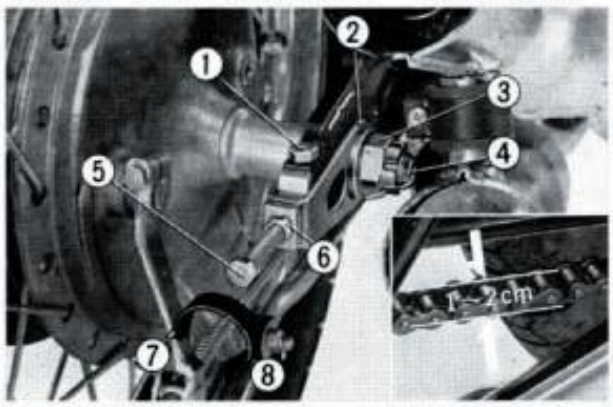

Fig. 38 ① Fork cap bolt ⑤ Adjust bolt ② Mark ⑥ Lock nut ③ Axle nut ⑦ Loosen ④ Cotter pin ⑧ Tighten

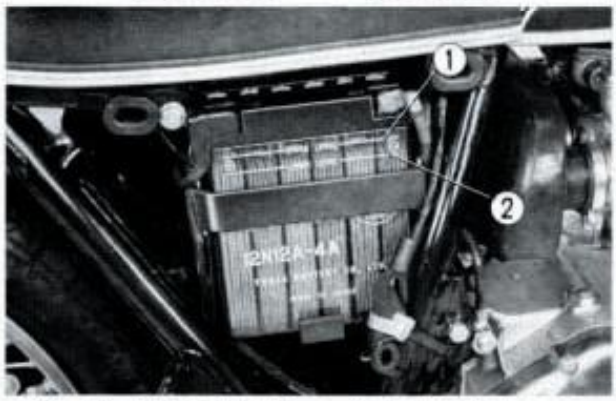

Fig. 39 ① Upper limit ② Lower limit

2. Perform the adjustment with the adjuster nut.

10. AIR CLEANER ELEMENT SERVICING

1. Open the seat and remove the tool tray.
2. Pull out the spring clip and take out the cleaner element.
3. Clean the element by tapping it lightly and blowing compressed air from inside.

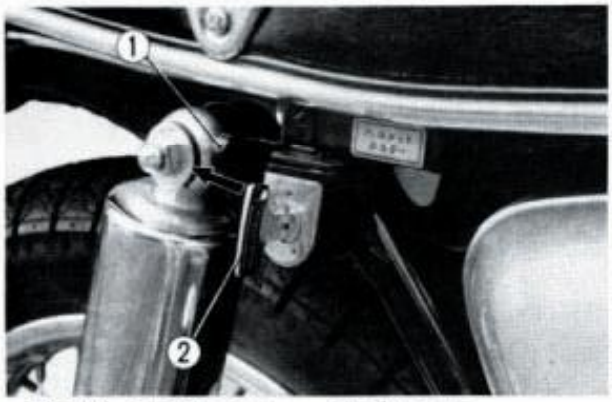

Fig. 36 ① Seat lever ② Seat lock

11. DRIVE CHAIN INSPECTION AND ADJUSTMENT

1. Check the slack in the chain by raising and lowering the chain at the midpoint between the sprockets. The normal slack is **1~2cm** (3/8~3/4 **in**).
2. Adjust by loosening the rear axle nut and turning the adjust bolts on both sides.

Note:
The marks on both adjusters should be at the same location when the chain is properly adjusted.

12. BATTERY ELECTROLYTE INSPECTION

Remove the right side cover and check the electrolyte level. The level should be at the upper limit.

1. If the level is low, open the seat and remove the tool tray to add distilled water to the battery.
2. Remove six battery filler caps and fill the water to each cell up to the upper limit.

13. FRONT FORK OIL REPLACEMENT

1. Remove the fork bolt and drain bolt, and then drain the oil.
   Actuate up and down the fork to drain the oil completely.
2. Flush the interior with the solvent.

Note:
Do not use gasoline for flushing.

3. Tighten the drain bolt securely and add new oil to the fork through the top of fork pipe.
   Recommended oil: **SAE 10 W~30**
   Capacity: 160 cc (5. 4 ozs)

Fig. 40 ① Fork bolts

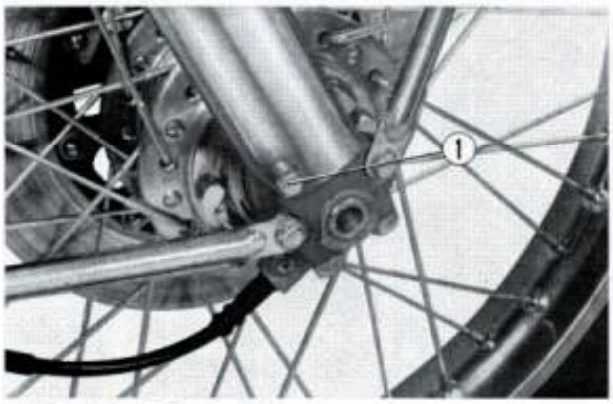

Fig. 41 ① Drain bolt

14. COMPRESSION PRESSURE CHECK

1. Remove the spark plugs.
2. Insert the end of the compression gauge into the spark plug hole.
3. Set both the throttle and choke to full open position and kick the kick starter.
   Standard compression pressure:
   12 kg/cm² (170. 67 psi)

Note:

- **Fully open the throttle and choke so that the true compression pressure will be indicated on the gauge.**
- **Continue the kicking until the compression reading is at maximum because the reading will increase with each kicking.**
- **To obtain the true pressure reading, perform the measurement after warming up the engine.**

(Low compression pressure)

When the compression pressure is below 10 kg/cm² (142. 23 psi), the probable causes are leaks around the valves and piston rings, or from the head and cylinder gaskets.
Adjust the valve tappet clearances, or disassemble the engine and inspect the piston rings and gaskets.

(High compression pressure)

When the pressure is greater than 12 kg/cm² (170. 67 psi), the probable cause is excessive carbon deposits on the combustion chamber, piston head and the valves. Disassemble the head and cylinder, to remove the carbon.

Fig. 42 ① Compression gauge

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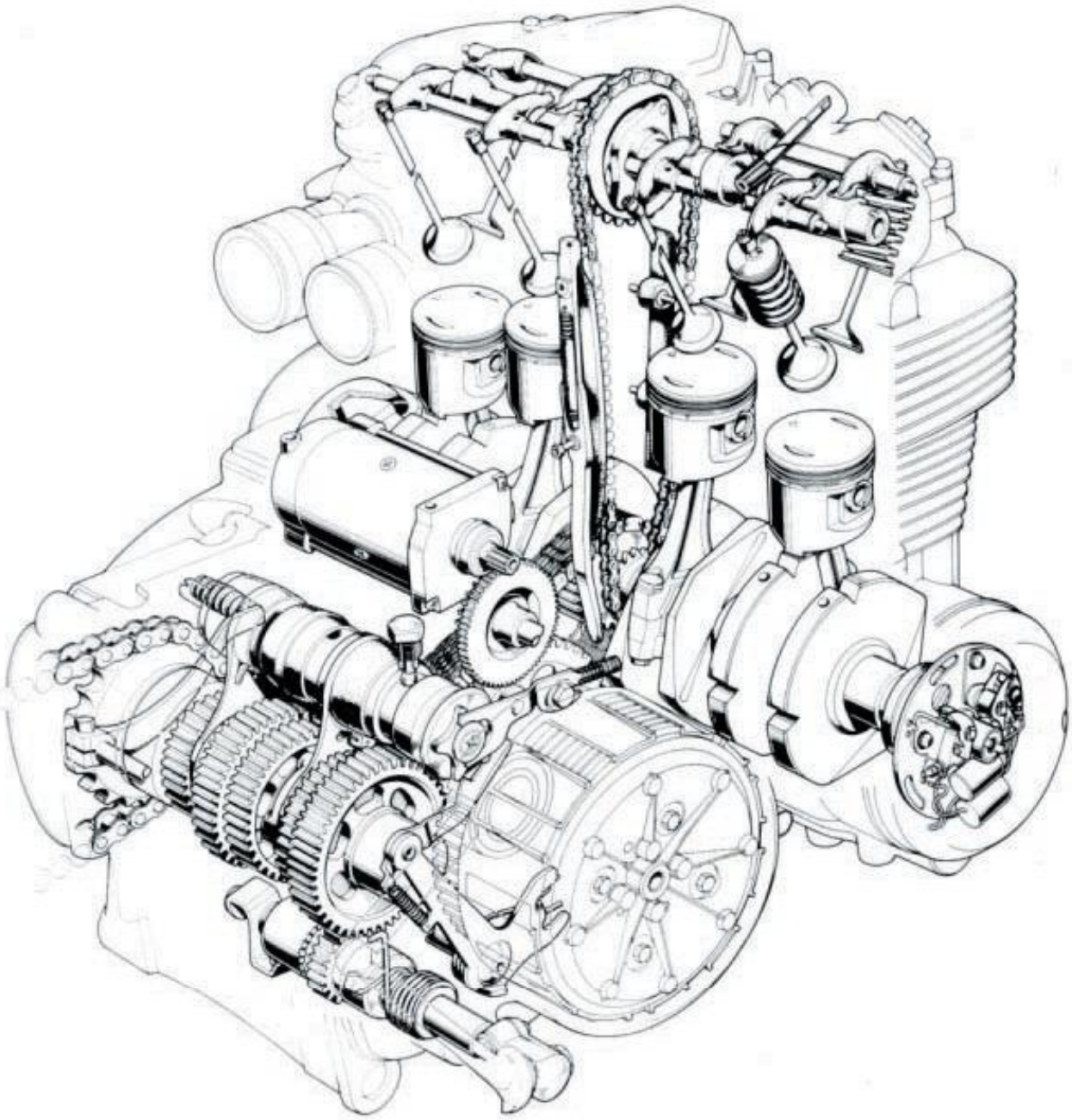
4. ENGINE



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1. SERVICING WITH ENGINE MOUNTED IN FRAME

Items	Pages
1. Cylinder Head Cover and Camshaft	24
2. Cylinder Head	24
3. Cylinder and Piston	24
4. Cam Chain Tensioner	25
5. Oil Filter and Oil Pump	36
6. Clutch	40
7. Gear Shift Mechanism	43
8. Electrical System i. e., (Generator and Starting motor)	95

2. ENGINE REMOVAL AND INSTALLATION

A. Removal

1. Turn the fuel cock to the "STOP" position, disconnect the fuel pipe at the tank, and dismount the fuel tank.
2. Unscrew the oil drain bolt and the oil filter center bolt, and drain the engine oil.
3. Remove the exhaust pipe and the muffler.
4. Disconnect the high tension cords at the spark plugs.
5. Disconnect the ground cable at the battery terminal.
6. Unscrew the 5 mm screw and disconnect the tachometer cable at the cylinder head cover.
7. Open the seat, take out the air cleaner element, unscrew three 6 mm bolts and remove the air cleaner case.

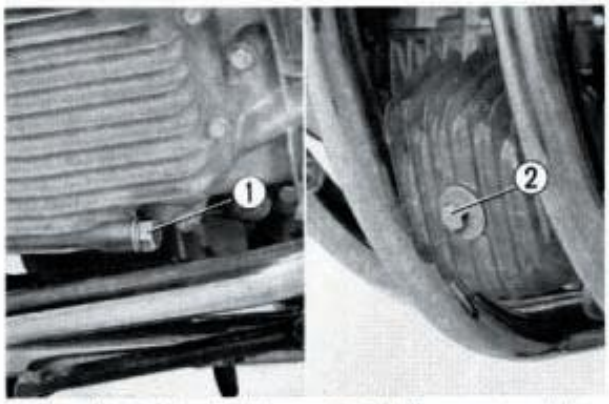

Fig. 43 ① Drain bolt ② Oil filter center bolt

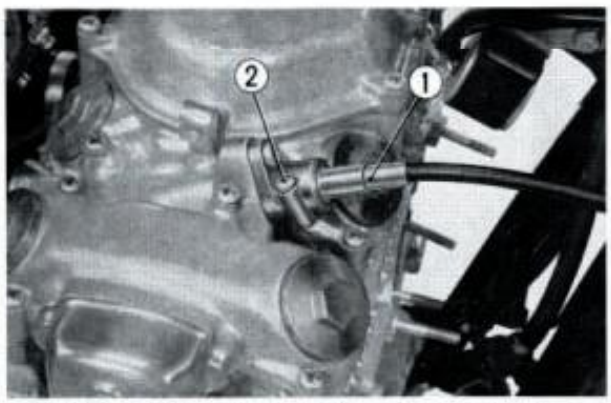

Fig. 44 ① Tachometer cable ② 5 mm screw

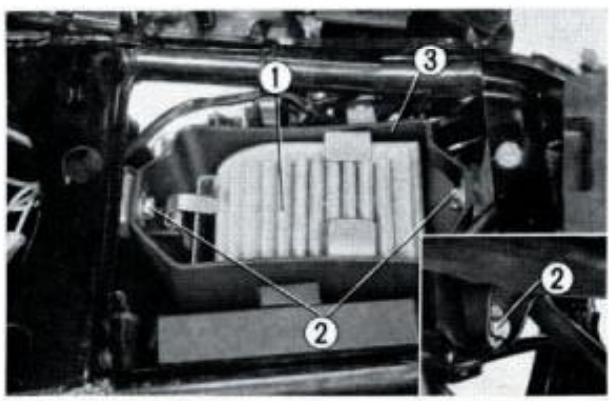

Fig. 45 ① Air cleaner element ② 6 mm bolts ③ Air cleaner case

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8. Disconnect the throttle cable at the carburetor.

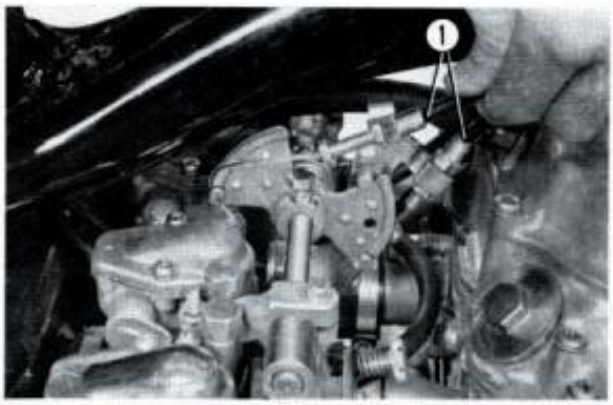

Fig. 46 ① Throttle cable

9. Loosen the two 5 mm screws at the carburetor insulator and the 4 mm screws at the air cleaner chamber. Remove the carburetor.

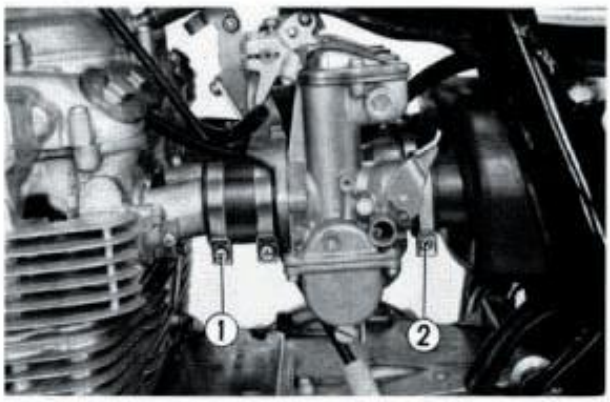

Fig. 47 ① 5 mm screw ② 4 mm screw

10. Disconnect the starting motor cable from the magnetic switch, and then the generator wiring at the coupler.

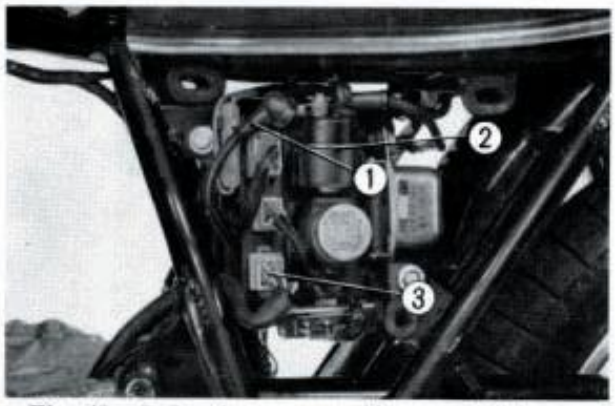

Fig. 48 ① Starting motor cable ② Magnetic switch ③ Wiring coupler

11. Remove the gear change pedal, unscrew the starting motor cover bolts, remove the starting motor cover, and then remove the left crankcase cover. Disconnect the clutch cable at the clutch lifter.

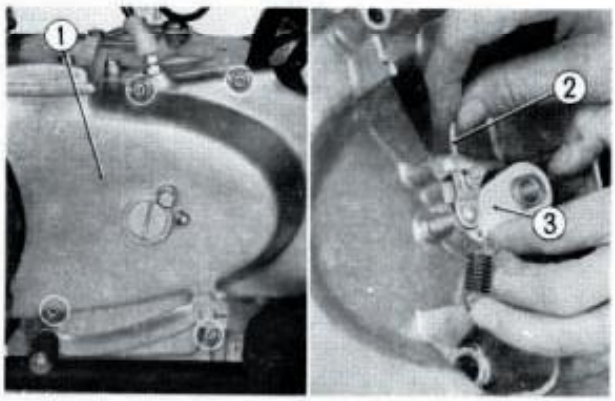

Fig. 49 ① Left crankcase cover ② Clutch cable ③ Clutch lifter

Fig. 50 ① Contact breaker point leads

12. Remove the final driven sprocket and the drive chain.

13. Disconnect the contact breaker point leads (yellow and blue) at the connectors.

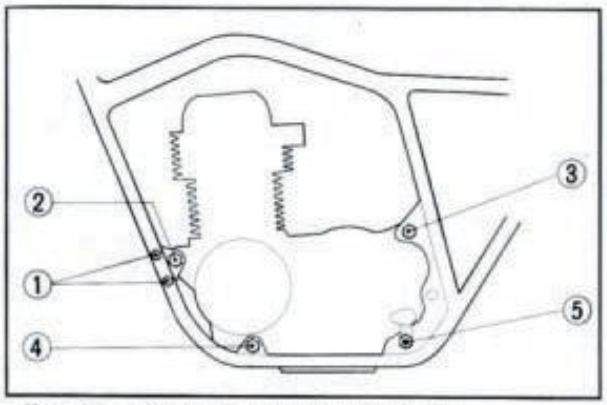

Fig. 51 Left side engine hanger bolts
① 8×50 hex bolt
② 10×50 hex bolt
③ Rear upper hanger bolt
④ 10×80 hex bolt
⑤ Rear lower hanger bolt

14. Unscrew the nuts from the engine hanger bolts, and dismount the engine from the right side by raising it's rear slightly.

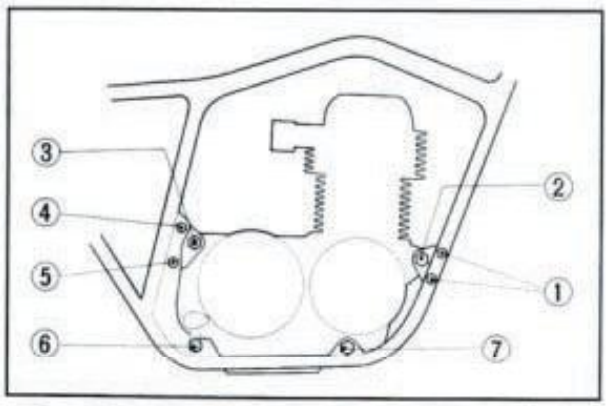

Fig. 52 Right side engine hanger bolts
① 8×50 hex bolt
② 10×50 hex bolt
③ Rear upper hanger bolt
④ 8×100 hex bolt
⑤ 8×40 hex bolt
⑥ Rear lower hanger bolt
⑦ 10×80 hex bolt

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

B. Engine Installation

1. Remount the engine in the reverse order of dismounting, however, attention should be given to the following points:

- Install the engine from the right side and tighten the hanger bolts. The battery ground cable terminal is installed together with the rear hanger bolt.
- Make sure that the generator cord and starting motor cord are not pinched when the left crankcase cover is installed.
- Make sure that the two mufflers on each side are properly connected with the muffler connecting band.
- Perform the following adjustments after the engine is installed.
  Clutch adjustment
  Drive chain slack adjustment
  Carburetor adjustment

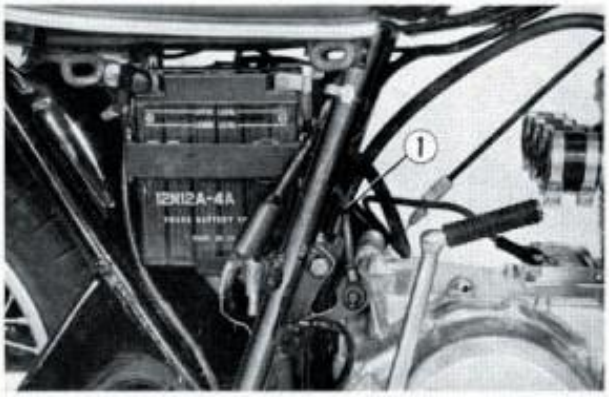

Fig. 53 ① Battery ground cable

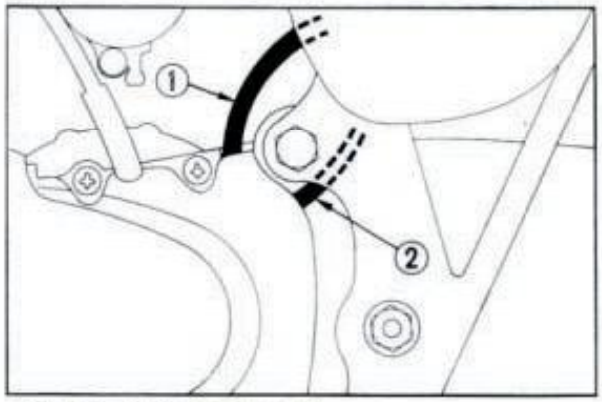

Fig. 54 ① Generator cord
② Starting motor cord

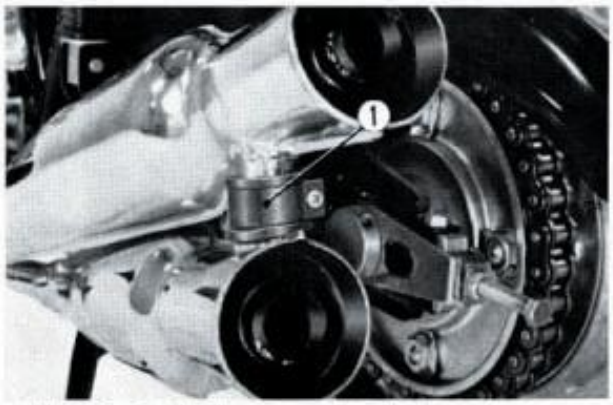

Fig. 55 ① Muffler connecting band

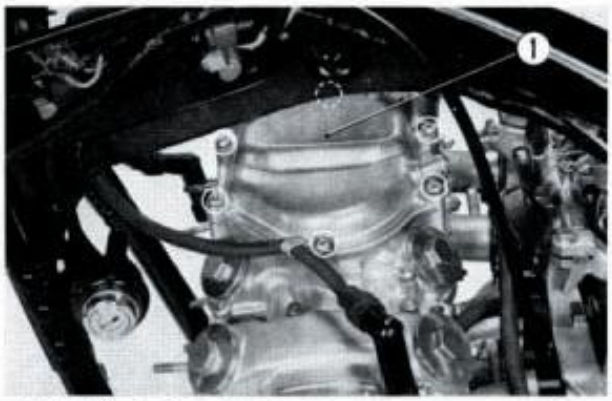

Fig. 56 ① Breather cover

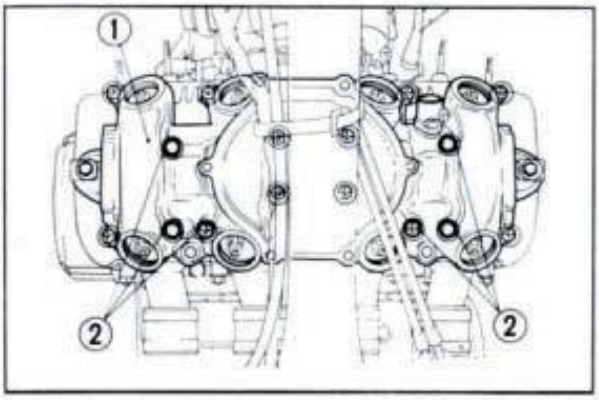

Fig. 57 ① Cylinder head cover
② 6 mm copper washers

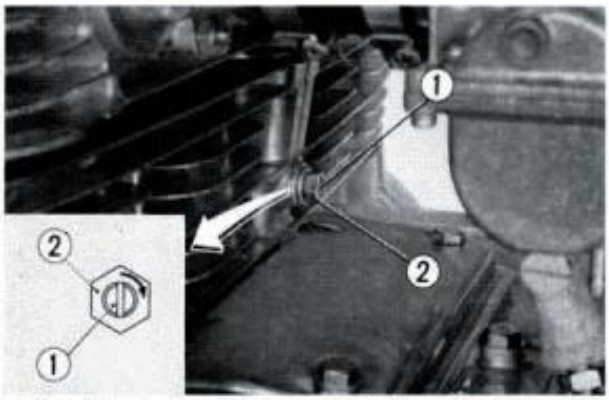

Fig. 58 ① Cam chain tension adjuster
② Lock nut

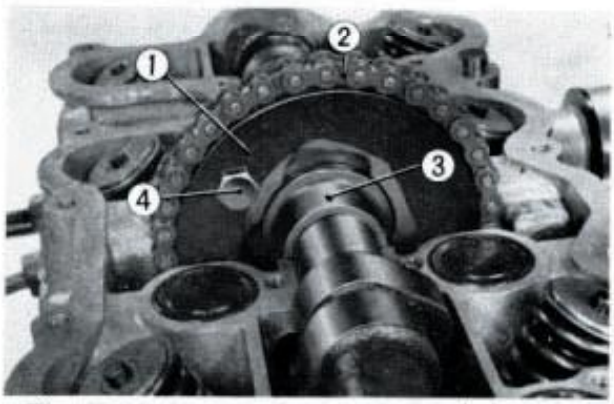

Fig. 59 ① Cam sprocket ③ Camshaft
② Cam chain ④ 7 mm bolt

3. CYLINDER HEAD, CYLINDER AND PISTON

A. Disassembly

1. Turn the fuel cock to the "STOP" position, disconnect the fuel lines at the tank, and dismount the fuel tank.
2. Remove the exhaust pipe and muffler.
3. Disconnect the tachometer cable.
4. Disconnect the high tension cords at the spark plugs, unscrew six 6 mm screws and remove the breather cover.
5. Remove the tappet hole caps, left and right side covers, unscrew twelve 6 mm screws and six bolts, and remove the cylinder head cover.

Note:

- **Loosen the screws and bolts uniformly to relieve the stress gradually.**

6. Loosen the lock nut of the cam chain tension adjuster (leave the wrench on the nut), turn the screw fully (approximately 90°) clockwise, and then tighten the lock nut.
   In this condition the cam chain tensioner is not applying tension to the cam chain.

7. Unscrew two cam sprocket mounting bolts and remove the camshaft from the sprocket.
8. Remove the cam chain from the sprocket.

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9. Separate the carburetor assembly from the cylinder head.
10. Unscrew the cam chain tensioner mounting bolt.

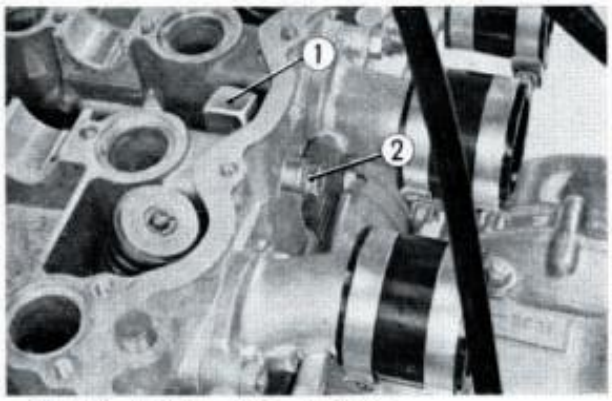

Fig. 60 ① Cam chain tensioner
② Cam chain tensioner mounting bolt

11. Unscrew twelve cylinder head mounting nuts and two 6 mm flange bolts, and remove the head. Loosen the nuts uniformly in the reverse order of tightening shown in Fig. 83.

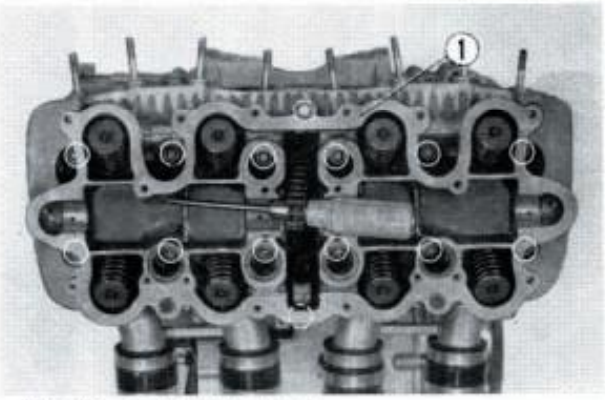

Fig. 61 ① Cylinder head

12. Remove the cam chain guide from the cylinder by raising the cam chain guide slightly, and rotate the guide 90° and removing it toward the top.
During this operation, do not drop the cam chain.

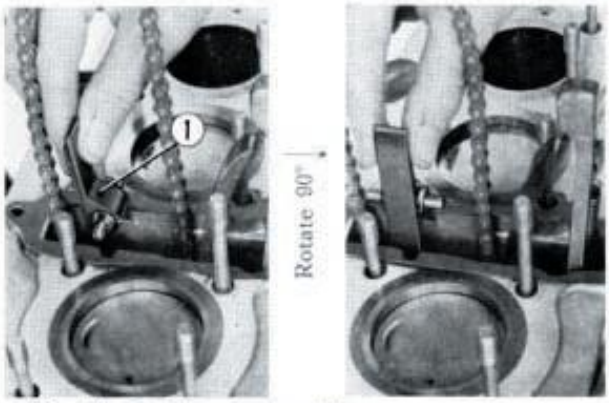

Fig. 62 ① Cam chain guide

13. Unscrew the cam chain adjuster lock nut (Fig. 58) and remove the chain tensioner from the cylinder.
To facilitate removal, raise the cylinder about 20 mm/1 in., and remove the cam chain tensioner.

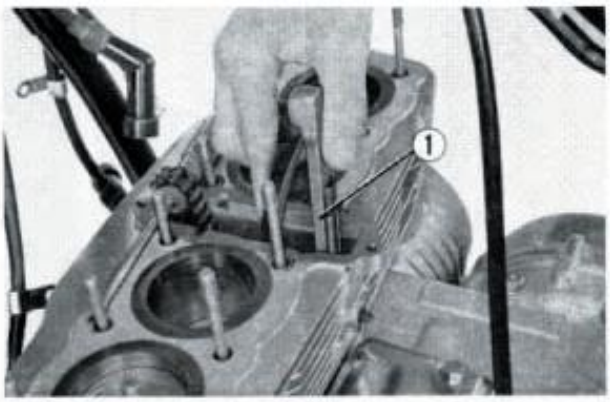

Fig. 63 ① Cam chain tensioner

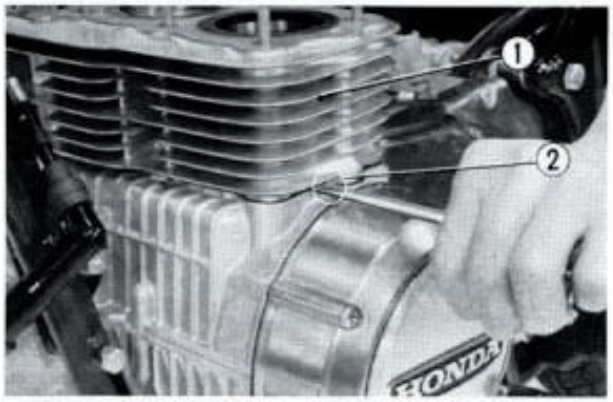

Fig. 64 ① Cylinder ② Cylinder groove

14. Remove the cylinder.
    If the cylinder is tightly stuck pry the cylinder loose with a screwdriver placed in the groove at the base of the cylinder.

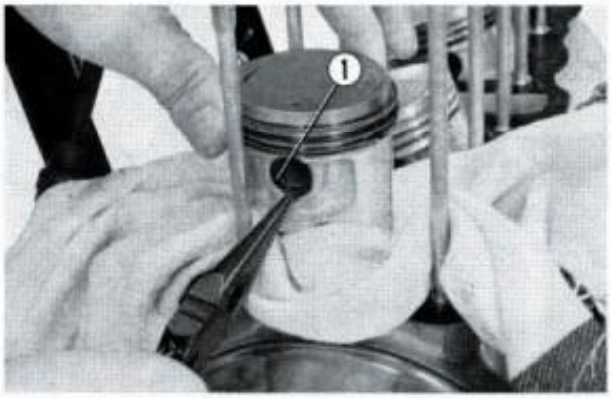

Fig. 65 ① Piston pin clip

15. Remove the piston pin clip, piston pin, and the piston.
    Note:
    When removing the pin clip, exercise care not to drop the clip into the crankcase.

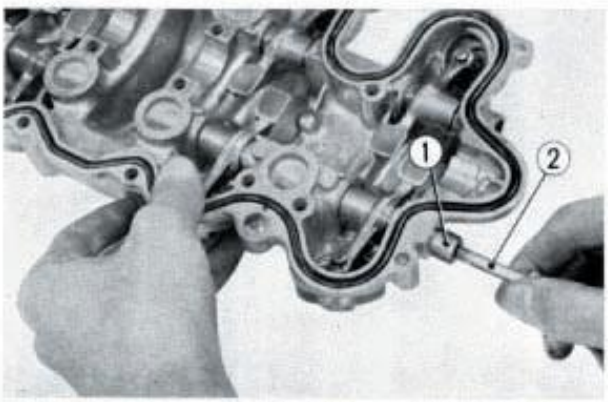

Fig. 66 ① Rocker arm shaft ② 6 mm bolt

16. Remove the piston rings.
17. Screw a 6 mm bolt into the rocker arm shaft and remove the rocker arm shaft from the cylinder head cover.

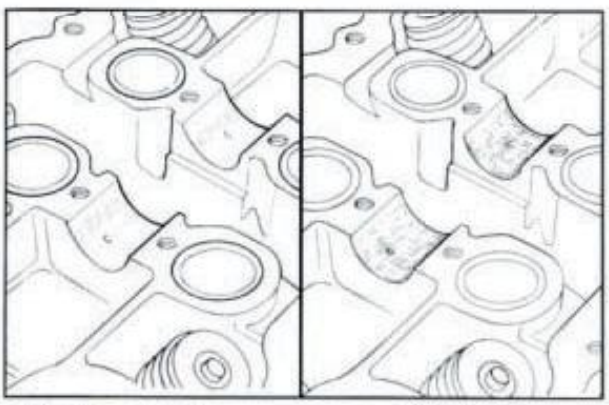

Fig. 67 Good No good

B. Inspection

1. Inspect the camshaft bearing surfaces.
   Camshaft bearing surfaces should be smooth and shiny. If it is scratched or excessively worn, it should be replaced.

Courtesy of Honda4Fun
www.hondafour.com www.honda4fun.com

2. Measure the height of the cam with a micrometer.
Replace the camshaft if beyond the serviceable limit.

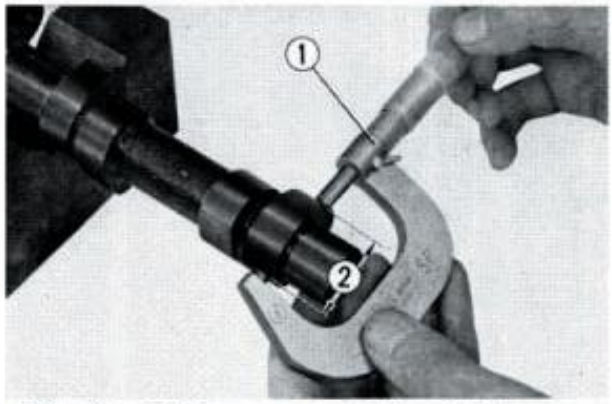

Fig. 68 ① Micrometer ② Cam height

3. Measure camshaft runout.
Support level both ends of the camshaft on V-blocks and with a dial gauge measure radial runout by rotating the shaft. Replace the camshaft if beyond the serviceable limit.
4. Also check the camshaft for scratch, wear and replace if necessary.

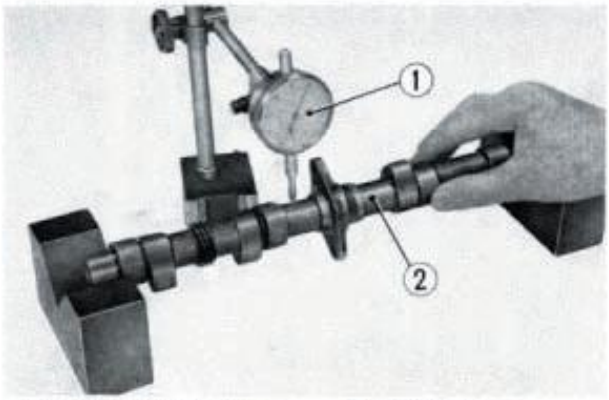

Fig. 69 ① Dial gauge ② Camshaft

5. Measure cylinder diameter at the top, center and bottom in both the X and Y axes. Rebore the cylinder if beyond the serviceable limit at any point.
When reboring the cylinder, rebore it to fit one of the four standard oversize pistons available.
Standard oversizes are **0.25, 0.50, 0.75 and 1.00 mm** (**0.009, 0.019, 0.029 and 0.039 in.**).

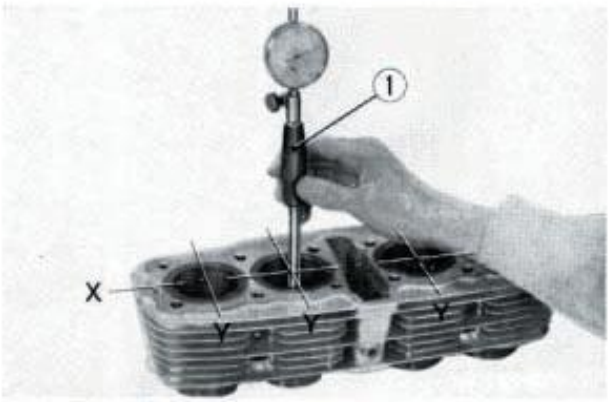

Fig. 70 ① Cylinder gauge

6. Measure piston diameter.
Measure the diameter at the piston skirt, 90° to the piston pin with a micrometer. Replace the piston if the diameter beyond the serviceable limit.

Fig. 71 ① Micrometer

Courtesy of Honda4Fun
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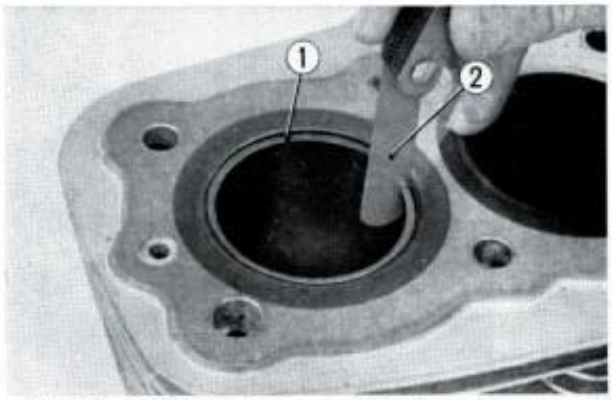

Fig. 72 ① Piston ring ② Feeler gauge

7. Measure piston ring end gap.
Insert the piston ring into the skirt of the cylinder so that it is squarely positioned, and measure the gap with a feeler gauge.

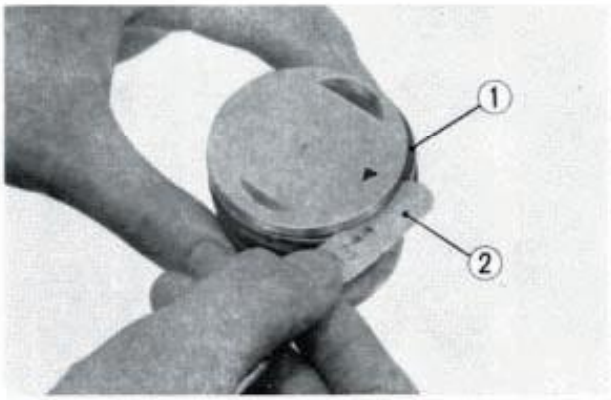

Fig. 73 ① Piston ring ② Feeler gauge

8. Measure piston ring side clearance.
Install the rings on the piston and measure the side clearance of the piston ring in the ring groove with a feeler gauge.

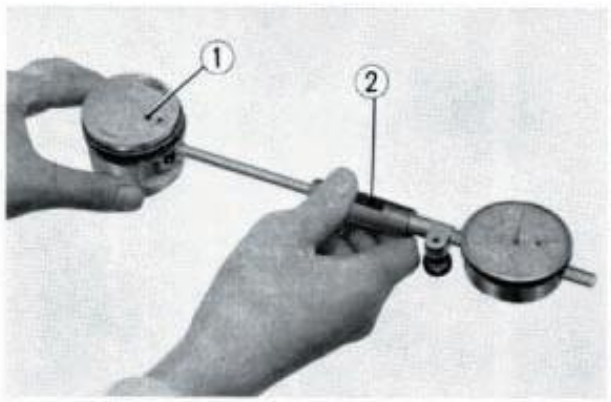

Fig. 74 ① Piston ② Cylinder gauge

9. Measure the piston pin hole using an inside micrometer or cylinder gauge.
10. Inspect the piston for damage, distortion and excessive wear.

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

C. Reassembly

1. Install the rocker arm and the rocker arm shaft in the cylinder head cover.
2. Install the piston rings on the piston with the marking on the rings toward the top.

Note:
When installing new rings on the piston, roll the rings in the ring grooves to assure proper clearance. If the rings roll smoothly, the clearance is satisfactory.

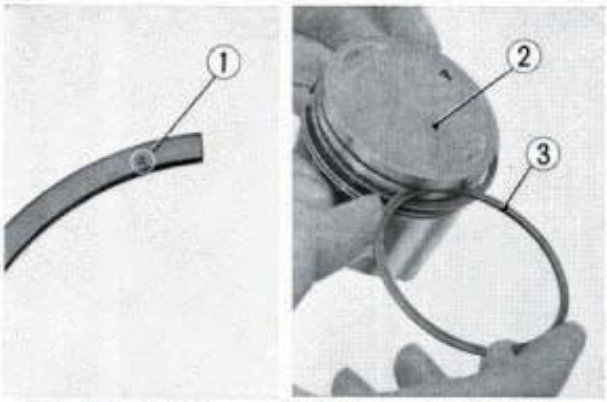

Fig. 75 ① Marks ② Piston ③ Piston ring

3. Install the piston on the connecting rod with the piston pin and clips so that the ▲ mark on the piston head points toward the front (exhaust side) as shown in the figure.

Note:
Always use new pin clips.

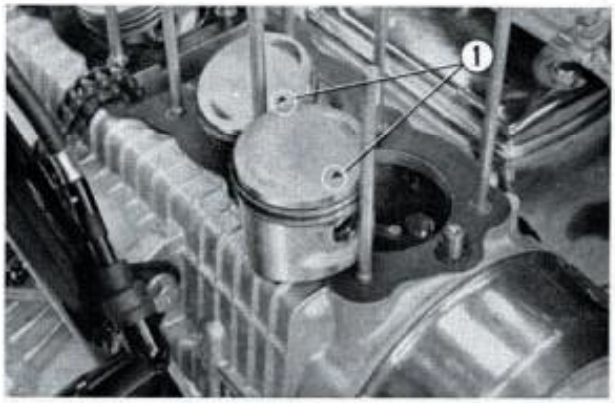

Fig. 76 ① ▲ marks

4. Stagger the end gaps of the top, 2nd and oil rings 120° apart.
   Install so that none of the gaps are on the piston boss axis or 90° away from it.

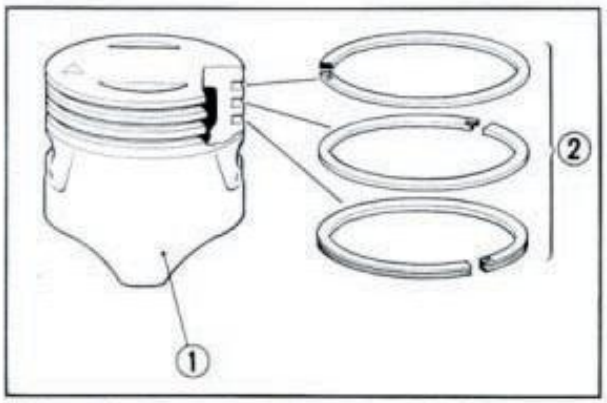

Fig. 77 ① Piston ② Rings

5. Install the cylinder gasket, two dowel pins (orifice valve) and two O-rings on the upper crankcase.

Note:
Before installing the dowel pin, blow compressed air through the hole to assure that it is not clogged.

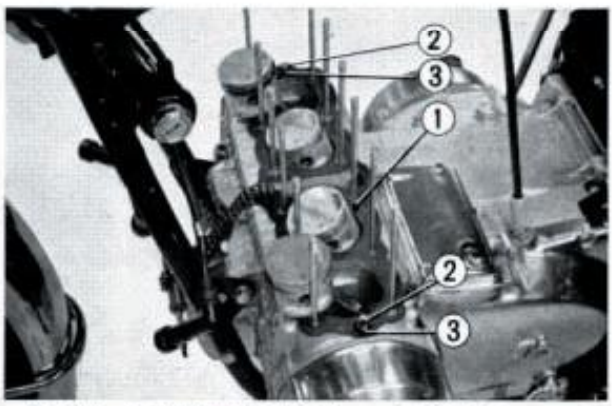

Fig. 78 ① Cylinder gasket ③ O-rings
② Dowel pins

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

Fig. 79 ① Piston bases ② Piston ring compressors

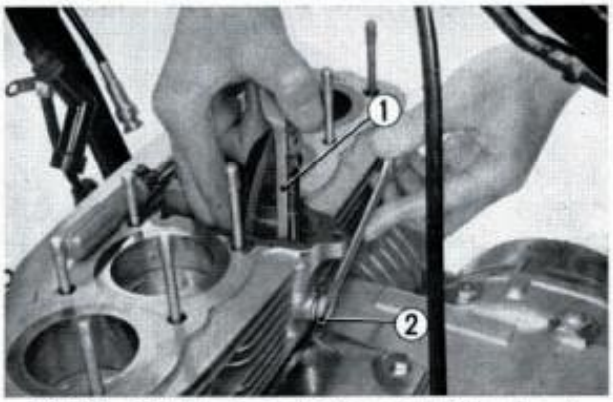

Fig. 80 ① Cam chain tensioner ② Lock nut

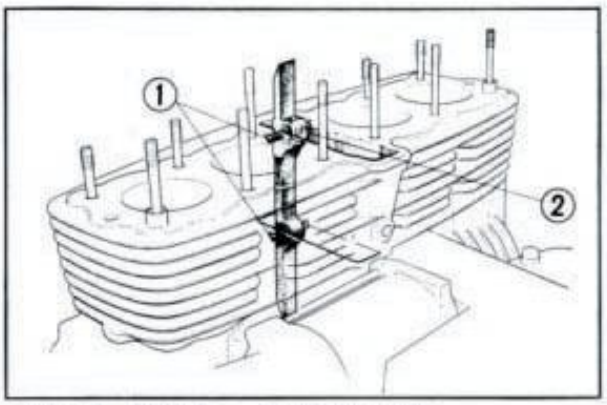

Fig. 81 ① Pins ② "UP" mark

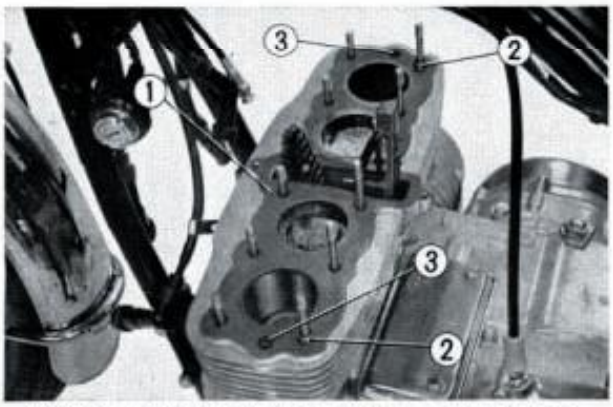

Fig. 82 ① Cylinder head gasket ③ O-rings
② Dowel pins

6. Turn the crankshaft and place the piston base (Tool No. 07033-55102) under No. 2 and 3 pistons, and install the piston ring compressors (Tool No. 07032-30001) on the piston rings, and insert the pistons into the cylinder. When the No. 2 and 3 pistons have entered the cylinder, remove the bases and piston ring compressors. Next turn the crankshaft slightly and install the No. 1 and 4 pistons being careful not to expose the rings of the No. 2 and 3 pistons. Raise the cam chain at the same time.
7. With the cylinder held approx. 20 mm from the crankcase, install the cam chain tensioner in the cylinder, hold the tensioner down by hand and install the O ring, steel washer, and tighten the lock nut.
8. Insert the cam chain guide into the cylinder as shown in Fig. 81.
9. Install the cylinder head gasket, two dowel pins and two O-rings on the cylinder.

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

10. Place the cylinder head and hold the cam chain with a screw driver to prevent cam chain from dropping.
11. Tighten the twelve 8 mm nuts uniformly with the special tool (Tool No. 07078-32301) to a torque of **2.0~2.2 kg-m (14.46~16.63 ft-lbs)** in the sequence shown in Fig. 83.
    Next, install and torque two 6 mm flange bolts.
    Mount the cam chain tensioner on the cylinder head with the aluminum washer and 6 mm bolt.

Note:
Exercise care not to drop nuts or washers into the cylinder head as it will be difficult to remove them.

12. Hold the cam chain sprocket and cam chain together and slide the camshaft through them from the right side, and set it on the bearings in the cylinder head. Install the cam chain on the cam sprocket.

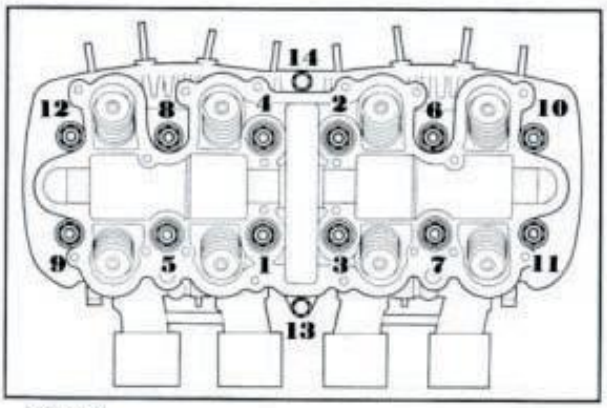

Fig. 83

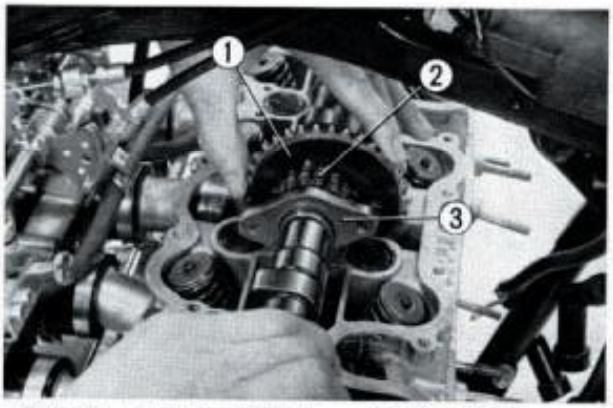

Fig. 84 ① Cam sprocket ② Cam chain ③ Camshaft

13. Remove the point cover, rotate the crankshaft in the clockwise direction and align the "T" (1.4) mark of the spark advancer to the timing mark. Next, position the camshaft so that the center of the cutout notch on the right end of the camshaft is aligned to the cylinder head flange surface.

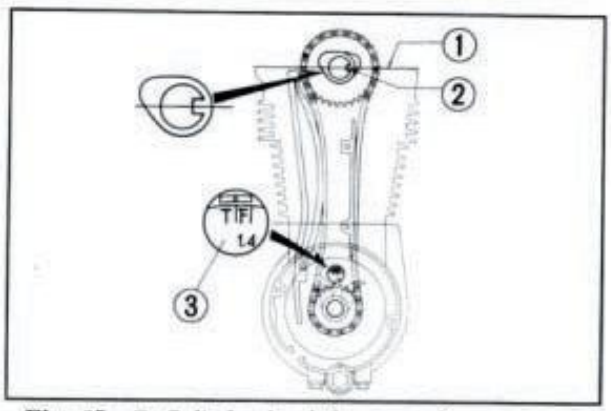

Fig. 85 ① Cylinder head flange surface ② Cutout notch ③ Spark advancer

14. Mount the cam sprocket on the camshaft with two 7 mm bolts.
15. Mount the carburetor assembly on the cylinder head.
16. Install the two dowel pins and six sealing rubbers on the cylinder head.

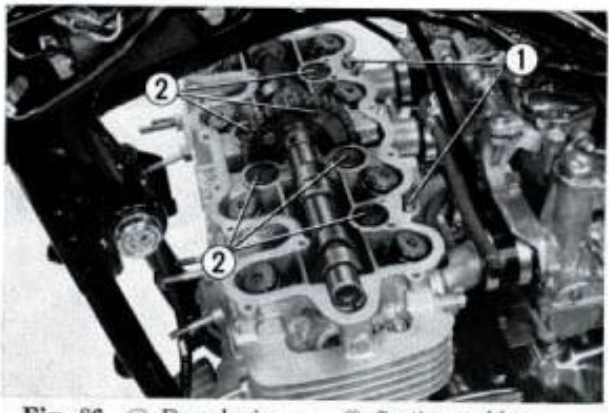

Fig. 86 ① Dowel pins ② Sealing rubbers

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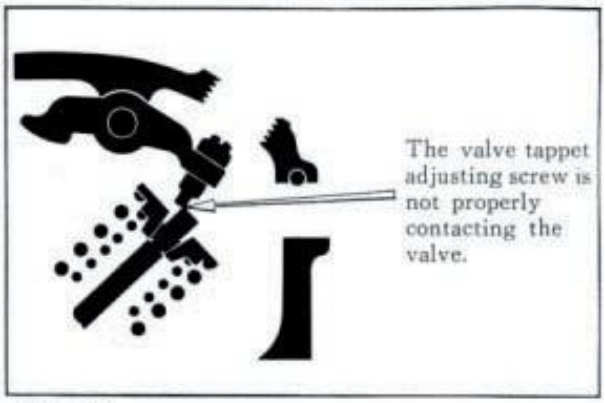

Fig. 87

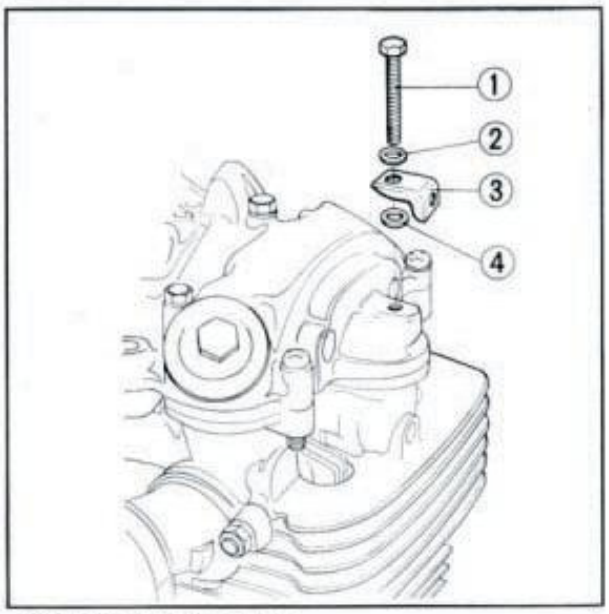

Fig. 88 ① 6 mm screw
② Chromium-plated copper washer
③ Head side cover set plate
④ Alminum washer

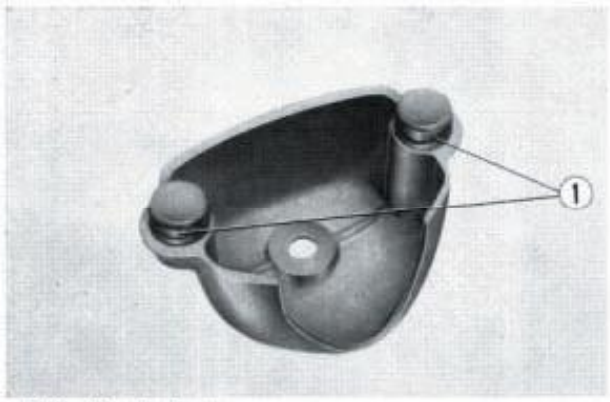

Fig. 89 ① O-ring

17. Install the cylinder head cover with twelve 6 mm screws and six 6 mm bolts, and torque to **0.8~1.2 kg-m (5.78~8.67 lbs-ft)** so that torque difference is not over **0.2 kg-m (1.44 lbs-ft).**

Note:

- **Insert fingers into the tappet hole cap opening and lift the valve tappet adjusting screw to check that they are properly meeting the valves.**
- **Use the six 6 mm copper washers as shown in Fig. 57.**
- **Install the head side cover set plate with washers mounted on both sides of the 6 mm screws (Chromium-plated copper washer on top and alminum washer on bottom).**

18. Install O-rings on the dowel pins of the the left and right side covers, and install the side covers on the cylinder head.
19. Install the breather cover with six 6 mm screws.

Note:

High tension cord clips are mounted on both sides with the clips facing forward.

20. Adjust the cam chain by referring to page 12.
21. Adjust the tappets by referring to page 7.

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4. VALVES AND VALVE SPRINGS

A. Disassembly

1. Remove the cylinder head by referring to section 3. A.
2. Compress the valve spring with a valve spring compressor (Tool No. 07031-30011), remove the valve cotters, and the valves.

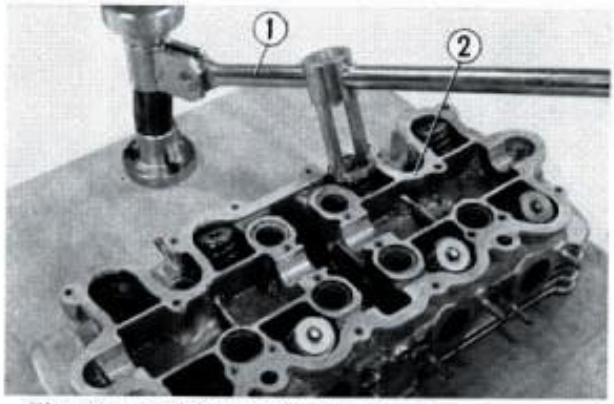

Fig. 90 ① Valve spring compressor ② Cylinder head

3. Drive the valve guide out of the cylinder head using the valve guide remover (Tool No. 07046-32301).
4. Remove the valve guide cap from the valve guide.

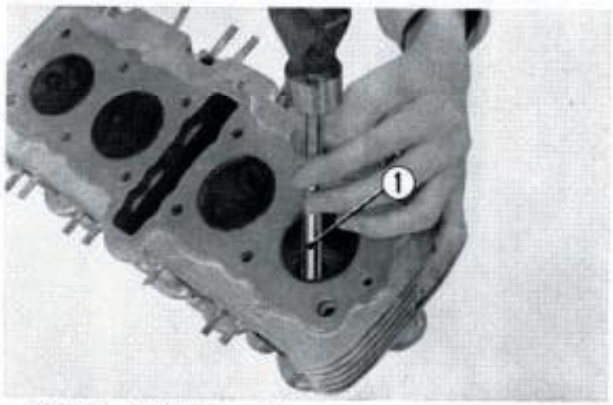

Fig. 91 ① Valve guide remover

B. Inspection

1. Measure valve stem clearance.
   Insert the valve into the guide and measure the clearance in both the X and Y directions using a dial gauge. Replace the valve and guide in set if clearance beyond the serviceable limit.
   Drive the guide into the cylinder head using a valve guide driver and finish ream the guide to the proper size. Standard valve guide inside diameter for both the inlet and exhaust is **5.475~5.485 mm (0.2153 in.~0.2157 in.)**

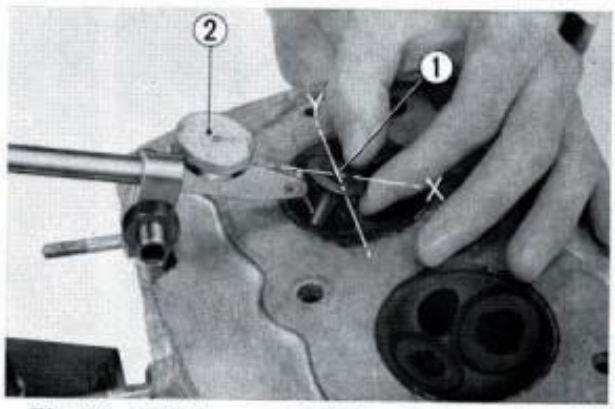

Fig. 92 ① Valve ② Dial gauge

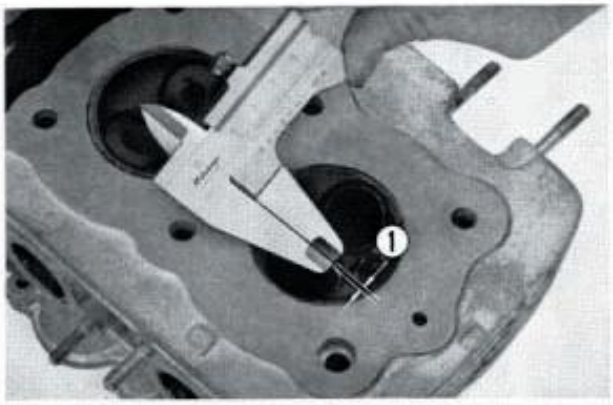

Fig. 93 ① Valve seat width

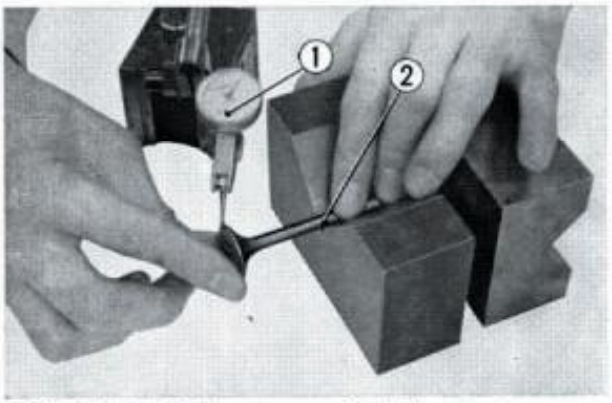

Fig. 94 ① Dial gauge ② Valve

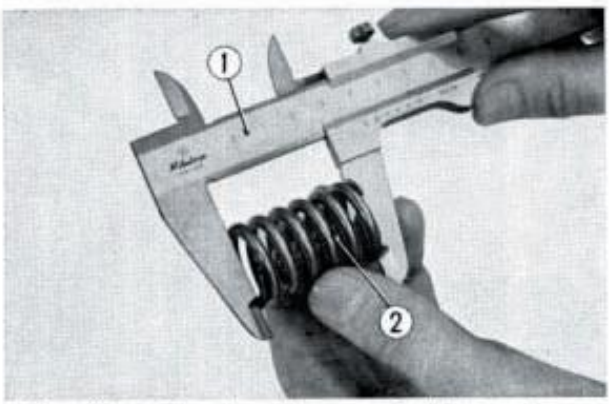

Fig. 95 ① Vernier caliper ② Valve spring

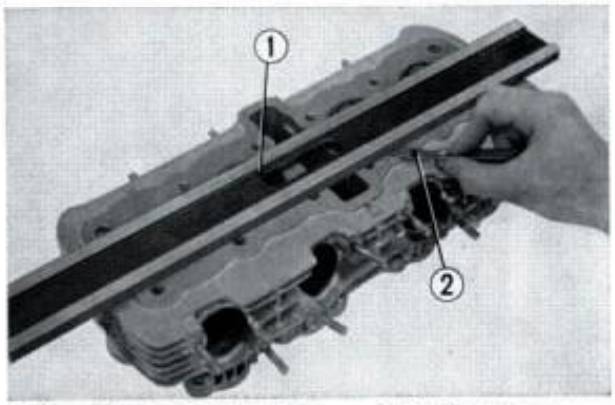

Fig. 96 ① Straight edge ② Feeler gauge

2. Measure the valve seat contact area. Apply a thin coat of bluing or red lead on the valve face, press the valve against the seat and turn. The imprint of the valve seat should be continuous around the face of the valve; if not, lap the valve and reinspect. If still unsatis factory, recut the valve seat with a valve seat cutter. First, cut the inside seat with an inside cutter, the top seat with a top cutter, and finally make the finish cut with a 90° cutter to produce a seat width of **1.0~1.5 mm (0.039~0.059 in.)**.
3. Measure valve runout.
   Place the valve on V-block and measure the runout of the valve with a dial gauge applied to the face of the valve while turning the valve. Replace the valve if the runout beyonds the serviceable limit.
4. Measure the valve spring.
   Measure the free length of the valve spring with a vernier caliper.
5. Measure the flatness of the cylinder head. Place a straight edge on the cylinder head surface and measure the clearance at several points with a feeler gauge. If there is a clearance of over the serviceable limit, lap the cylinder head surface on the surface plate using lapping compound or replace the head if it cannot be repaired.

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C. Reassembly

1. Wash all of the component parts in kerosene and reassemble the parts in the reverse order of disassembly.

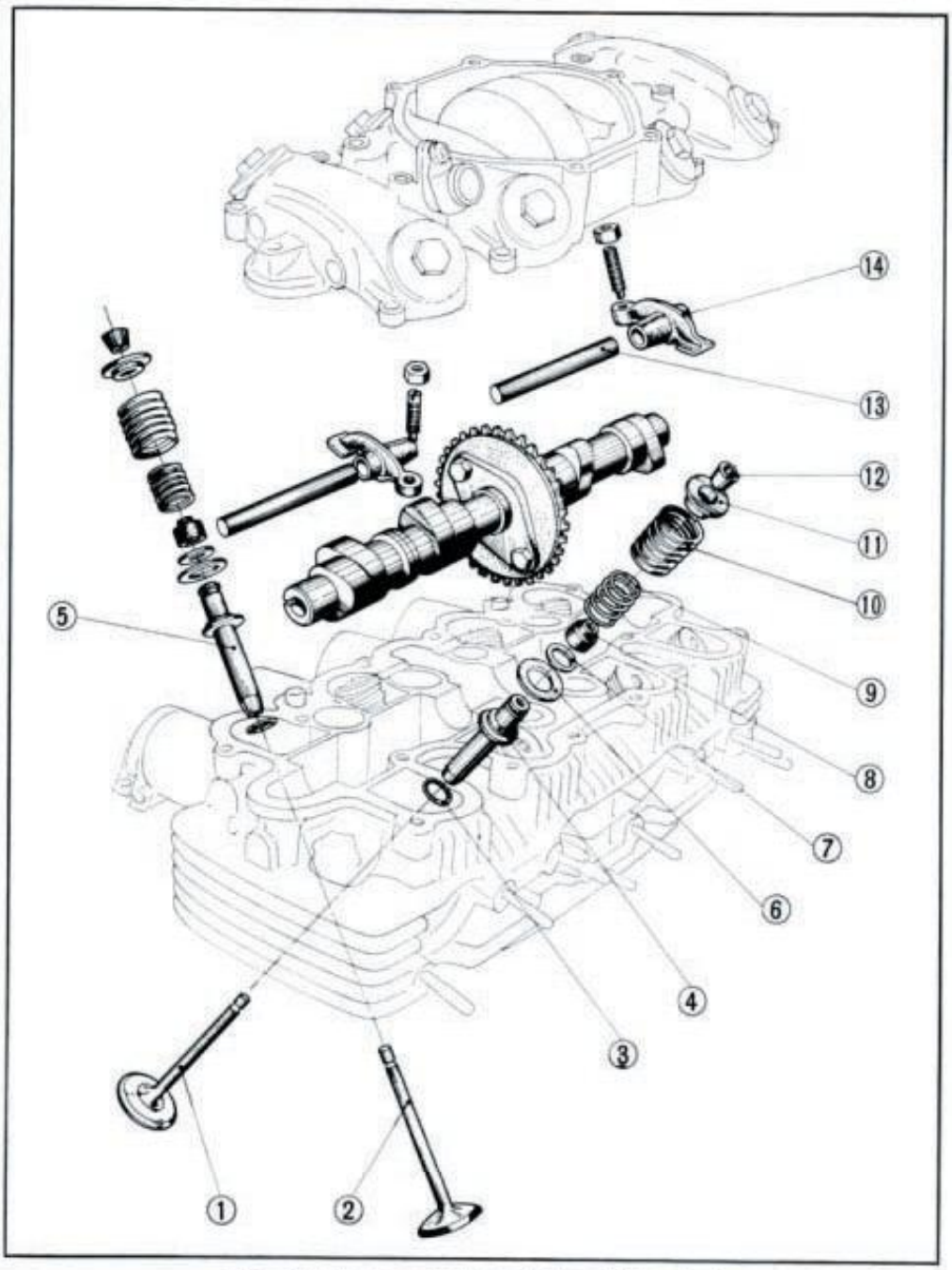


Fig. 97 Component parts of the cylinder head

① Exhaust valve
② Inlet valve
③ 10×1 mm O ring
④ Exhaust valve guide
⑤ Inlet valve guide
⑥ Valve spring outer seat
⑦ Valve spring inner seat
⑧ Valve stem seal
⑨ Inner valve spring
⑩ Outer valve spring
⑪ Retainer
⑫ Cotter
⑬ Valve rocker arm shaft
⑭ Valve rocker arm

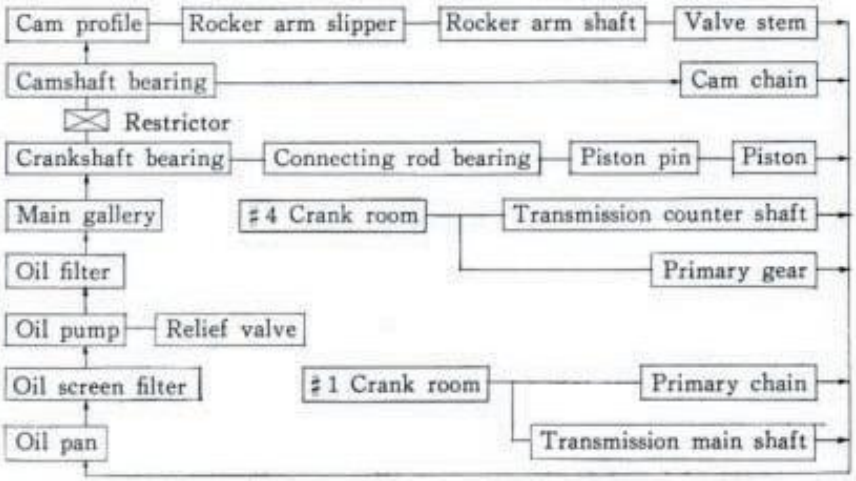
Note:
When installing the valves, apply a liberal amount of oil on the valve stem.

2. Install the cylinder head in accordance with section 3. C.

5. Oil Pump and Oil Filter

The oil pump is a trochoid type driven by the primary shaft. Screen and paper element filters are used to provide clean oil to the engine.

Lubricating System Block Diagram



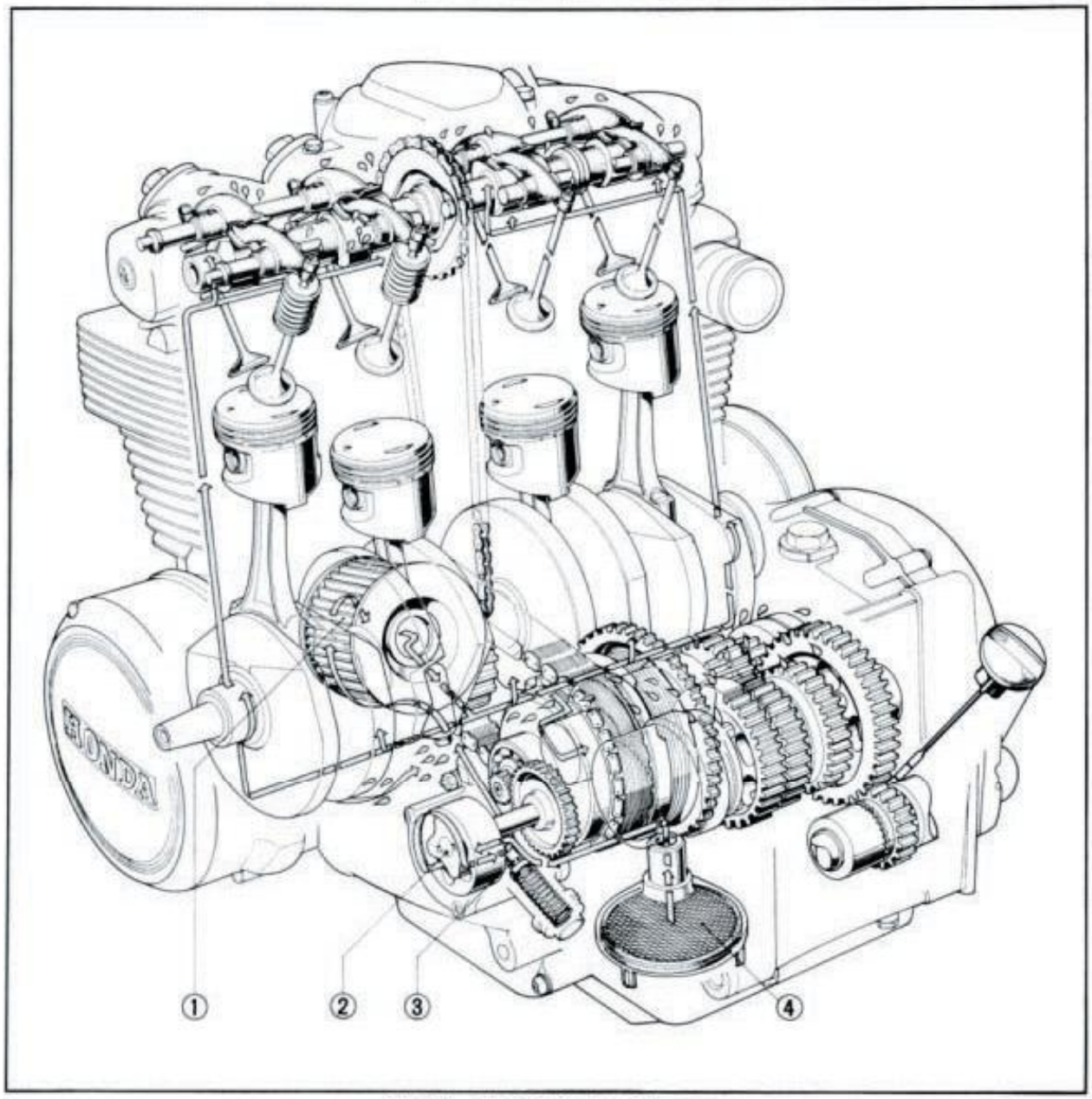


Fig. 98 Oil Lubricating Diagram
① Oil cleaner element ② Oil pump ③ Relief valve ④ Oil screen filter

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A. Disassembly

Oil Pump

1. Drain the engine oil in accordance with section 2. A.
2. Remove the starting motor cover and the left crankcase cover.
3. Unscrew the 4 mm bolt and remove the pressure switch wiring. Next remove three 6 mm screws, and the oil pump.

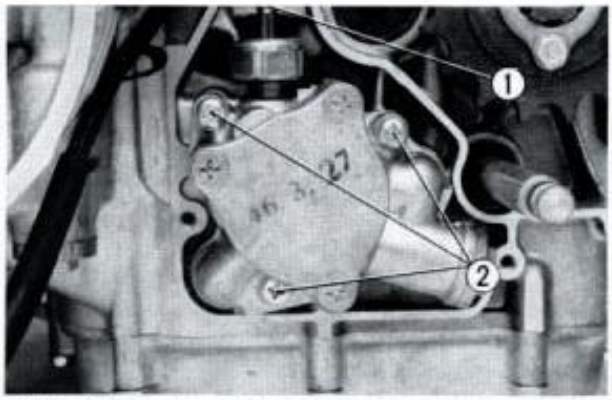

Fig. 99 ① 4 mm bolt
② 6 mm screws

4. Remove the cap and disassemble the relief valve and spring.

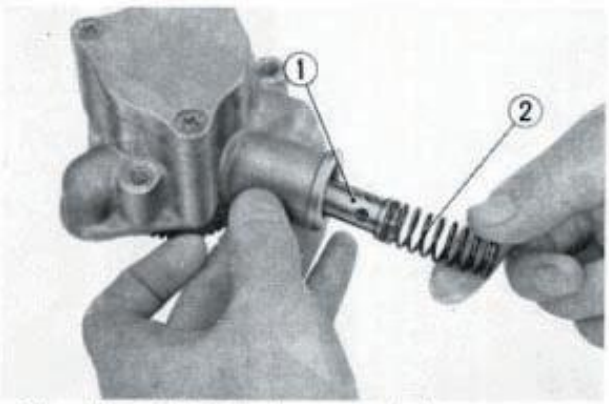

Fig. 100 ① Relief valve ② Spring

Oil Screen Filter

1. Drain the engine oil in accordance with section 2. A.
2. Unscrew ten 6 mm bolts from the oil pan. Remove the oil pan, and the oil screen filter can be removed.

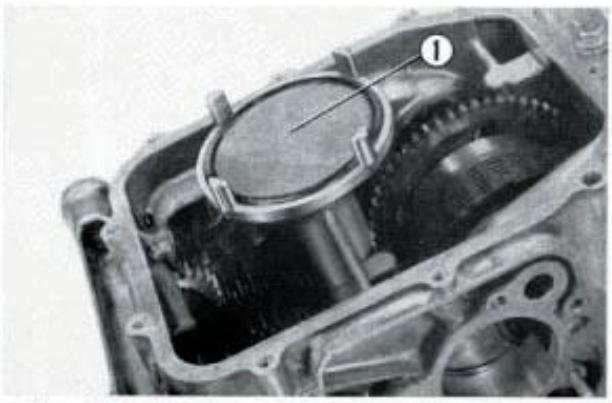

Fig. 101 ① Oil screen filter

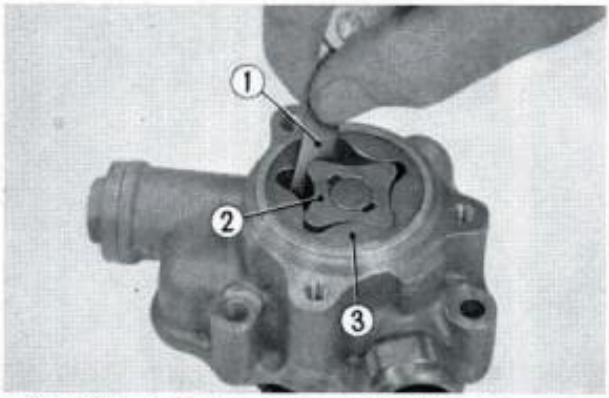

Fig. 102 ① Feeler gauge ③ Outer rotor
② Inner rotor

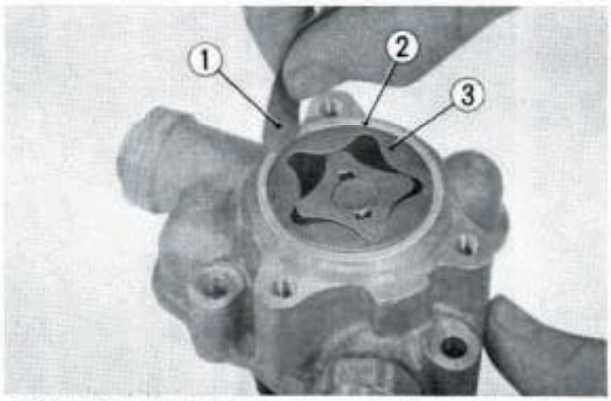

Fig. 103 ① Feeler gauge ③ Outer rotor
② Pump body

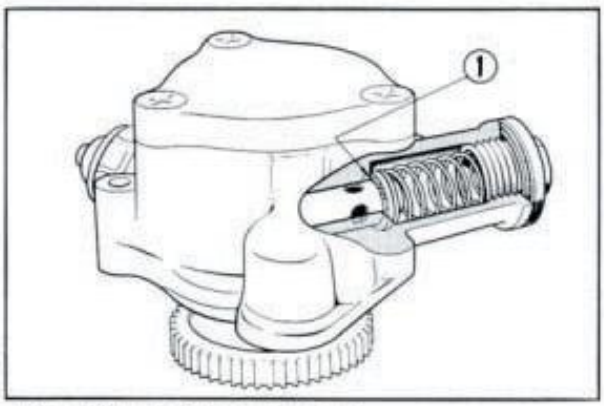

Fig. 104 ① Relief valve seat

Oil Filter

1. Drain the engine oil in accordance with section 2. A.
2. Unscrew the center bolt to remove the oil filter.

B. Inspection

1. Measure the clearance between the inner and outer rotors.
   Use a feeler gauge to measure the clearance between the rotors. If the clearance beyonds the serviceable limit, replace the pump.
2. Measure the clearance between the outer rotor and the pump body.
   Use a feeler gauge to measure the clearance between the outer rotor and the pump body. If the clearance beyonds the serviceable limit, replace the pump.
3. Inspect the operation of the relief valve. Make sure that the relief valve is not stuck in the pump body. Also check for any foreign objects which may be lodged between the valve and seat.
4. Inspect the screen filter
   Wash and inspect the screen filter. Replace the filter if damaged.

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C. Reassembly

Oil Filter

1. Insert the oil filter center bolt through the oil filter case and assemble the spring, spring seat and element. Screw the center bolt into the engine.

Oil Screen Filter

1. Mount the screen filter on the lower crankcase.
2. Mount the oil pan on the engine with ten 6 mm bolts.

Oil Pump

1. Insert the drive pump shaft into the oil pump body and install the drive pin into the shaft.
2. Align the outer and inner rotor punch marks and install into the pump body (the surfaces with the punch marks may be set to the pump body side or the pump cover side).
3. Install the 47 mm O-ring on the oil pump body and install the oil pump cover with three 6 mm screws.
4. Install the relief valve and spring into the oil pump body, and install the cap.
5. Install the two O-ring collars, two 14 mm O-rings, and a 47 mm O-ring into the oil pump body and then install the oil pump on the crankcase with three 6 mm screws.
6. Connect the pressure switch wires.
7. Install the left crankcase with four 6 mm screws, and the gear change pedal.
8. Install the starting motor cover.

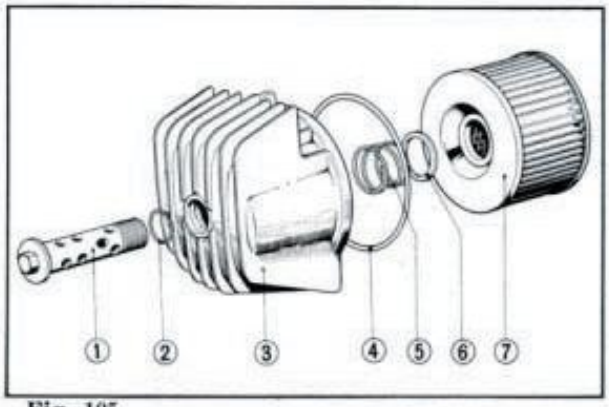

Fig. 105
① Oil filter center bolt
② 15×2.5 mm O-ring
③ Oil filter case
④ 89×4.5 mm O-ring
⑤ Filter element set spring
⑥ Oil filter spring seat
⑦ Oil filter element

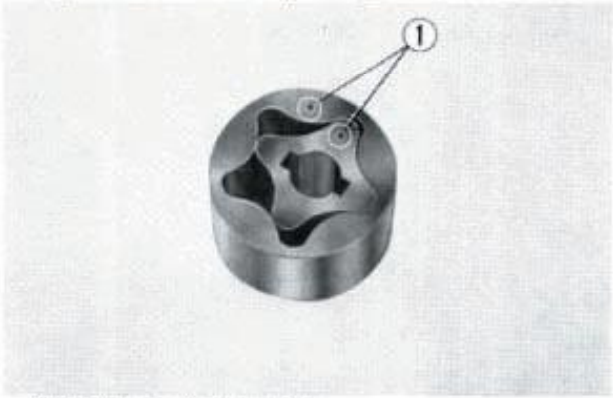

Fig. 106 ① Punch marks

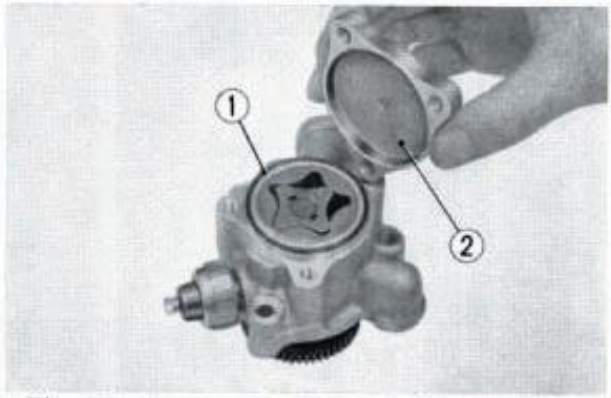

Fig. 107 ① 47 mm O-ring ② Oil pump cover

Fig. 108 ① O-ring collar ② 14 mm O-ring ③ 47 mm O-ring

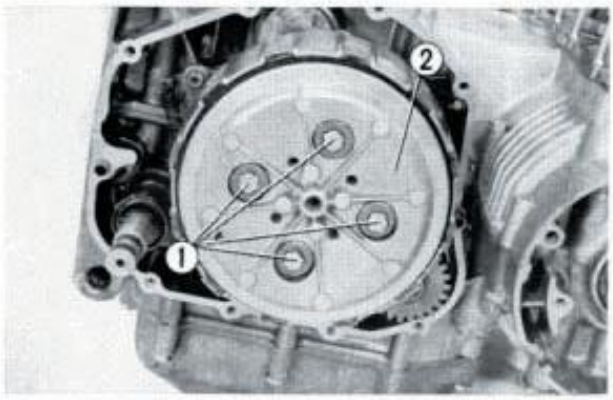

Fig. 109 ① Bolts ② Clutch pressure plate

6. CLUTCH

A. Disassembly

1. Drain the engine oil in accordance with section 2. A.
2. Remove the kick starter pedal.
3. Unscrew ten 6 mm screws and remove the clutch cover.
4. Unscrew the four clutch pressure plate mounting bolts, and remove the clutch pressure plate and four clutch springs.

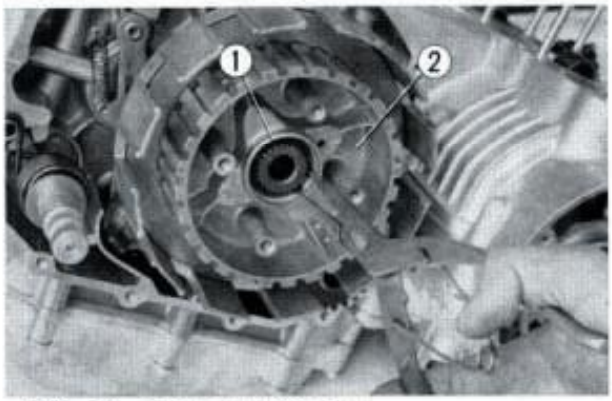

Fig. 110 ① 25 mm snap ring
② Clutch assembly

5. Remove the clutch lifter joint piece.
6. Remove the 25 mm snap ring, shims (some engine may not have shims installed), and the clutch assembly from the main shaft.

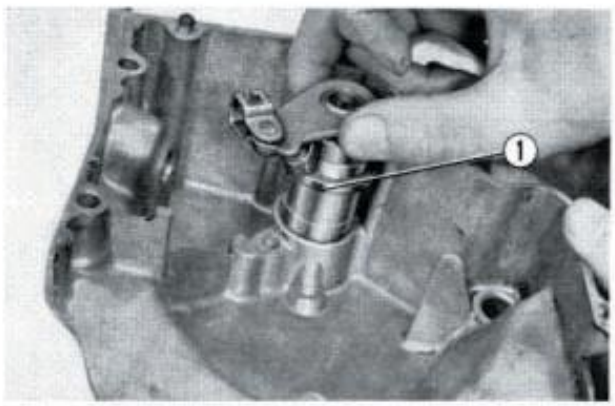

Fig. 111 ① Clutch adjuster

7. Disassemble the clutch disc, clutch plate and clutch center from the clutch outer.
8. Remove the left crankcase cover.
9. Disconnect the clutch cable from the clutch lifter.
10. Unscrew the clutch adjuster lock bolt and remove the clutch adjuster from the left crankcase cover.

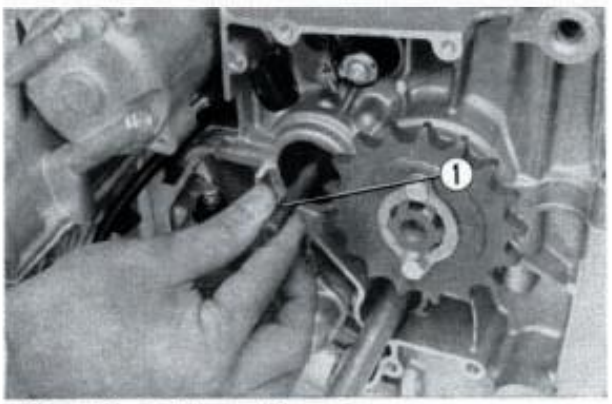

Fig. 112 ① Clutch lifter rod

11. Pull out the clutch lifter rod.

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B. Inspection

1. Measure the thickness of the friction disc. Measure the thickness with a vernier caliper and replace if beyond the serviceable limit.

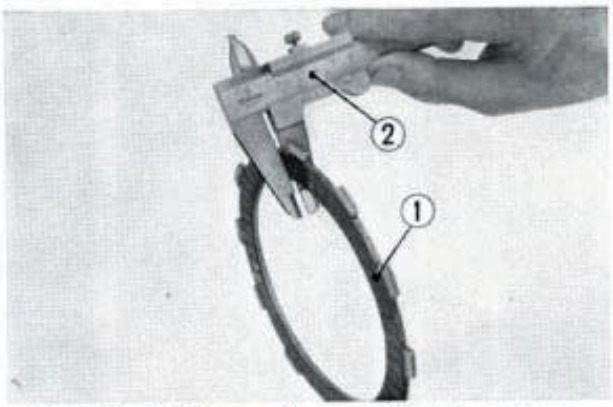


Fig. 113 ① Friction disc ② Vernier caliper

2. Check the clutch plate for warp.
   Place the clutch plate on the surface plate and measure the amount of warp using a feeler gauge. If the warp beyonds the serviceable limit, replace the clutch plate.
3. Measure the clutch spring.
   Measure the free length of the clutch spring with a vernier caliper and replace if beyond the serviceable limit.

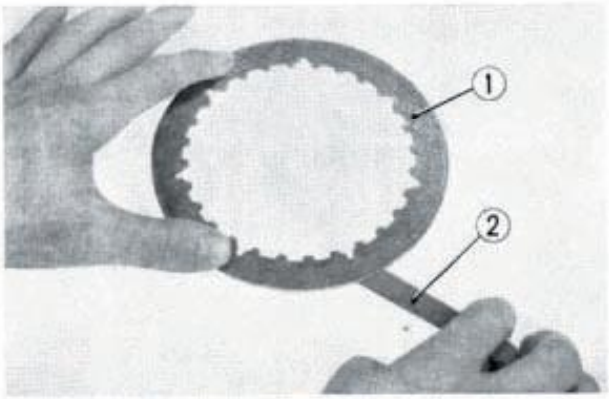


Fig. 114 ① Clutch plate ② Feeler gauge

4. Inspect the rivets mounting the clutch outer to the driven gear for looseness, and replace the clutch outer if any of rivets are loose.

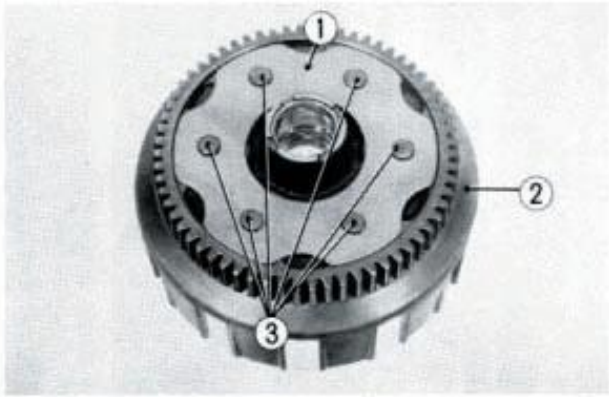


Fig. 115 ① Driven gear ② Clutch outer ③ Rivets

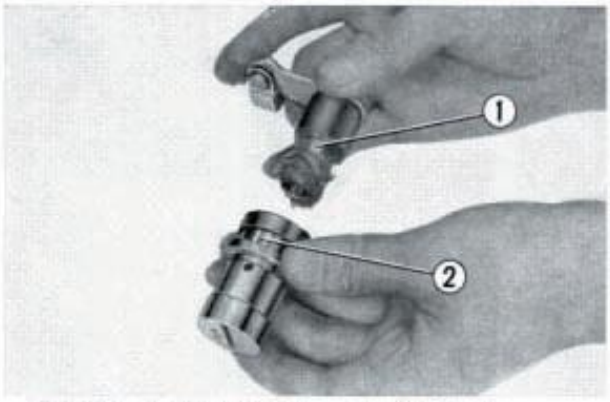


Fig. 116 ① Clutch lifter ② Adjuster

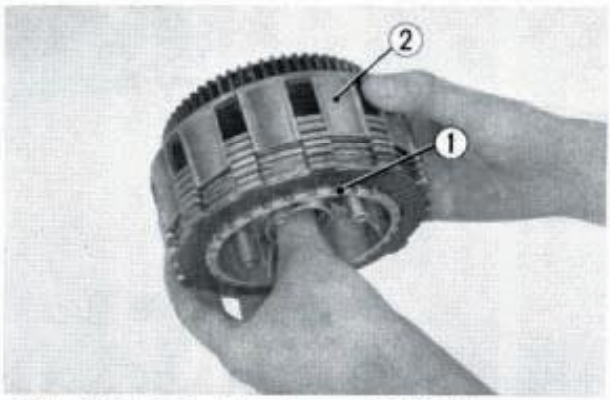


Fig. 117 ① Clutch center ② Clutch outer

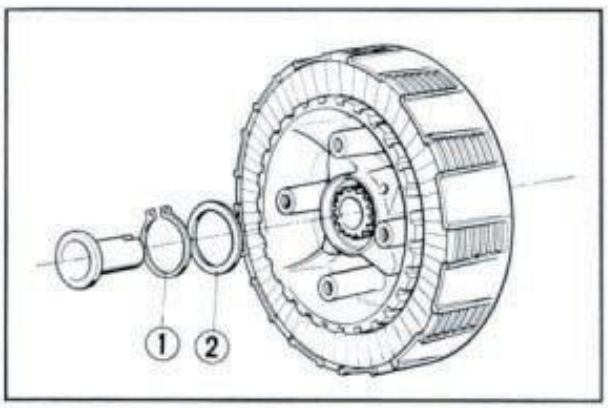


Fig. 118 ① 25 mm snap ring ② Shim

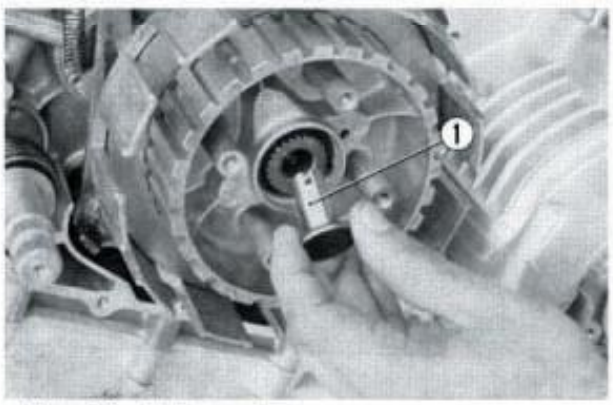


Fig. 119 ① Joint piece

C. Reassembly

1. Assemble the clutch lifter rod into the main shaft so that the spherical end is toward the right side.
2. Apply grease to the clutch lifter and assemble it to the left crankcase cover together with the adjuster. Tighten the lock bolt and reconnect the clutch cable to the clutch lifter.
3. Set the steel ball into the clutch lifter and mount the left crankcase cover with four 6 mm screws.
4. Apply engine oil on the friction discs and assemble them on the clutch center alternately with the clutch plates. Finally assemble into the clutch outer.
5. Install the clutch assembly on the main shaft and the 25 mm snap ring. Place a dial gauge against the end of the clutch assembly to check for looseness in axial direction. If the measured value greater than **0.1 mm** (**0.004 in.**), install a shim on the inside of the snap ring. Shims are available in the thicknesses of 0.1, 0.3, and 0.5 mm.
6. Insert the clutch lifter joint piece into the main shaft, and fix the clutch plate with four clutch springs, washers, and 6 mm bolts.
7. Install the clutch cover with ten 6 mm screws.

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

7. GEAR SHIFT MECHANISM

A. Disassembly

1. Disassemble the clutch in accordance with section 6. A.
2. Remove the gear change pedal.
3. Hold the gear shift arm down while removing.

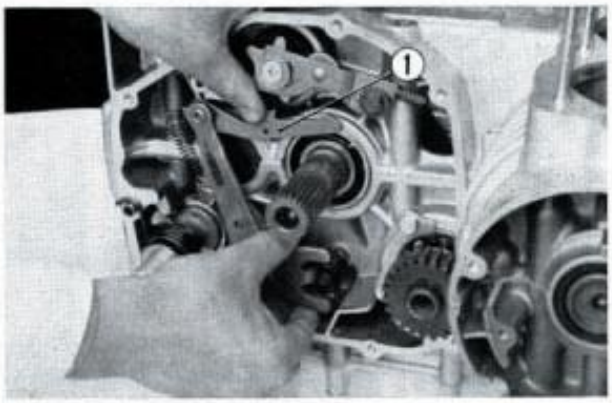


Fig. 120 ① Gear shift arm

4. Loosen the shift drum stopper bolt and remove the shift drum stopper. Next, unscrew the 6 mm flat head screw and remove the stopper cam plate.

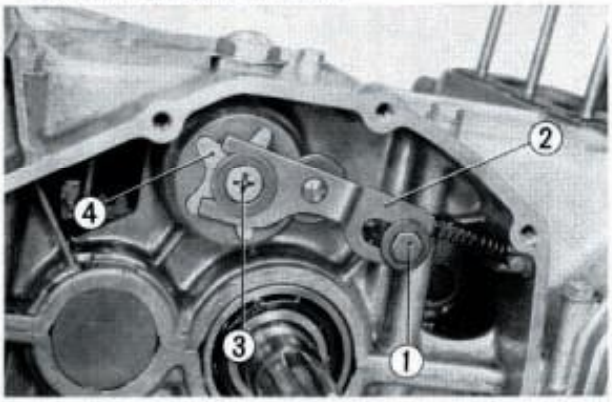


Fig. 121 ① Shift drum stopper bolt
② Shift drum stopper
③ 6 mm flat head screw
④ Stopper cam plate

5. Separate the upper and lower transmission cases, and disassemble the transmission gears in accordance with section 9. A.
6. Remove the neutral stopper switch from the gear shift drum.
7. Remove the shift drum guide screw from the upper crankcase, and remove the spring cap and the ball.

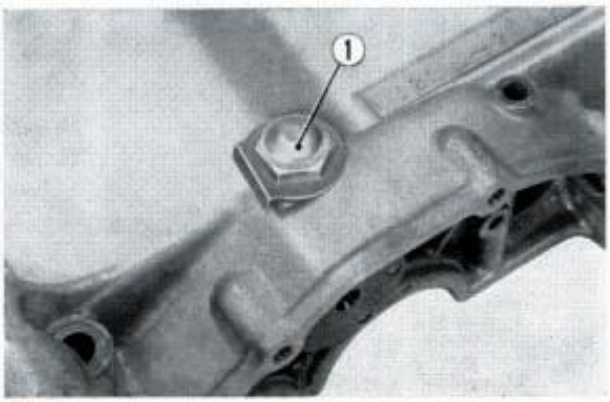


Fig. 122 ① Shift drum guide screw

8. Remove the guide pin clips and guide pins, and pull out the gear shift drum from the crankcase.

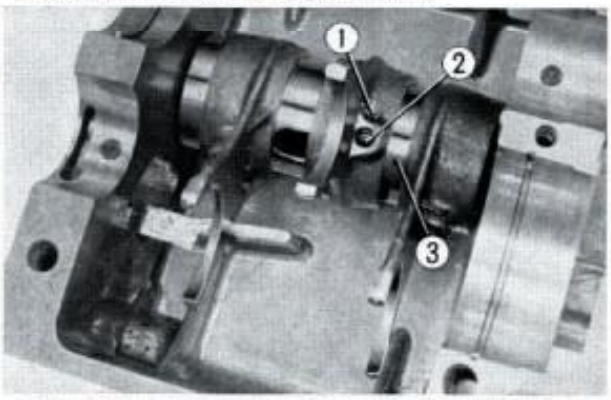


Fig. 123 ① Guide pin clip ② Guide pin ③ Gear shift drum

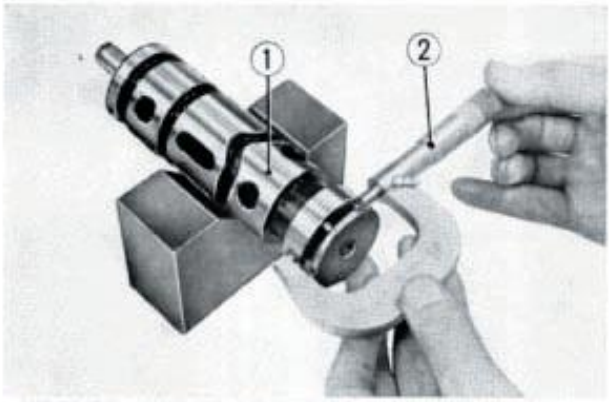


Fig. 124 ① Gear shift drum ② Micrometer

B. Inspection

1. Measure the diameter of the gear shift drum with a micrometer and the shift fork with an inside micrometer. Replace any part which exceeds the serviceable limit.

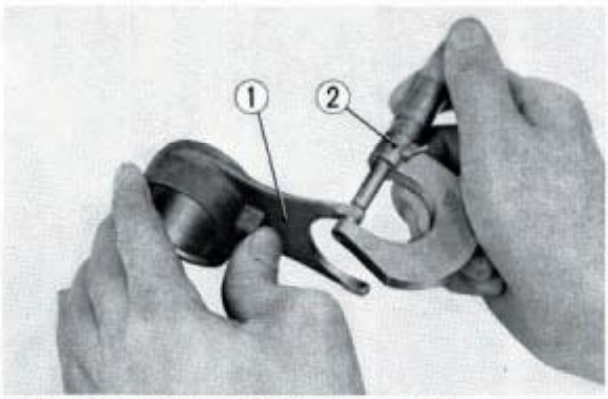


Fig. 125 ① Gear shift fork ② Micrometer

2. Measure the width of the gear shift fork fingers with a micrometer.
Replace if beyond serviceable limit.

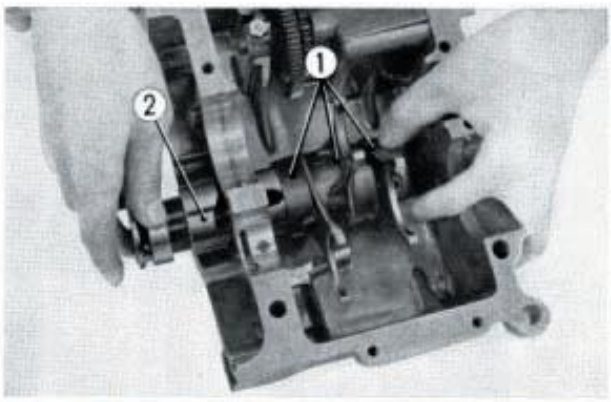


Fig. 126 ① Gear shift forks ② Gear shift drum

C. Reassembly

1. Set the left, right and center gear shift forks into the upper crankcase as shown in Fig. 126, then install the gear shift drum.

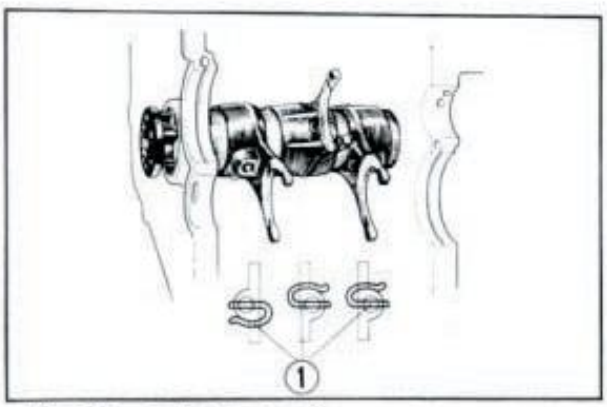


Fig. 127 ① Guide pin clips

2. Insert the guide pin into the shift fork and fix it with the guide pin clip.

Note:
Make sure that the guide pin clip is installed in the proper direction.

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

3. Place the counterbored section of the shift drum as shown Fig. 128, and install the steel ball, the spring cap, and the spring then lock with the shift drum screw.
   Next, bend up the tab on the guide screw lock washer to lock the guide screw.

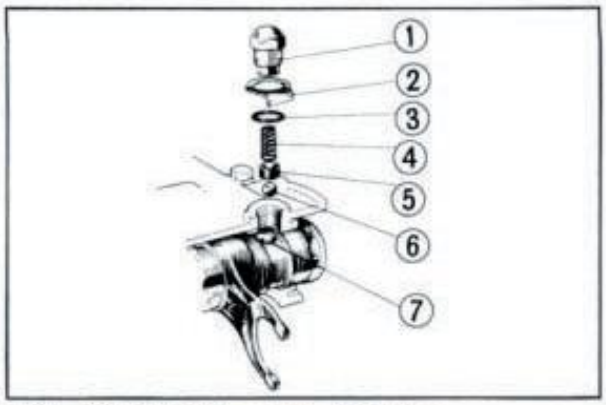


Fig. 128 ① Guide screw ② Guide screw lock washer ③ O-ring ④ Spring ⑤ Spring cap ⑥ Steel ball ⑦ Counterbored section

4. Align the neutral switch to the groove in the gear shift drum and lock in place with the 6 mm screw.

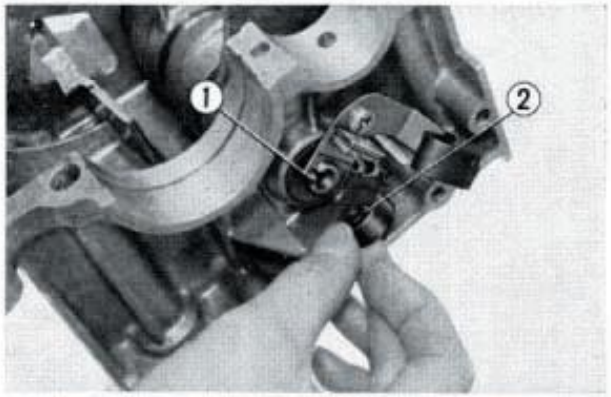


Fig. 129 ① Gear shift drum ② Neutral switch

5. Assemble the transmission into the upper crankcase in accordance with section 10. C, and assemble the upper and lower crankcase.
6. Install the cam plate on the pin of the gear shift drum with the 6 mm flat head screw which has been coated with thread lock cement.

Note:
The pin and the pin hole in the cam plate must be aligned.

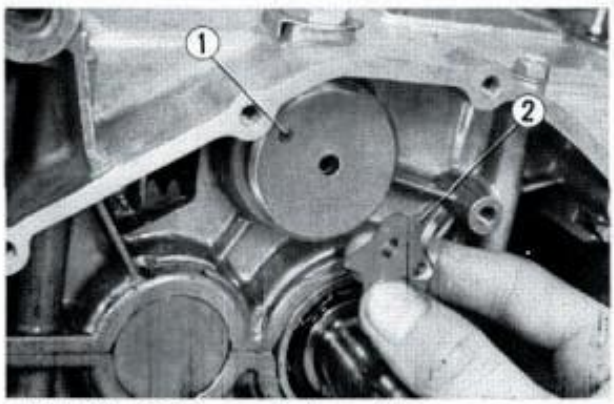


Fig. 130 ① Pin ② Cam plate

7. Insert the spring into the shift drum stopper, install the end of the spring into the crankcase groove as shown in Fig. 131, and tighten the shift drum stopper bolt. After tightening the bolt, make sure that the shift drum stopper operates smoothly. If there is excessive vertical looseness the shift drum stopper should be replaced.

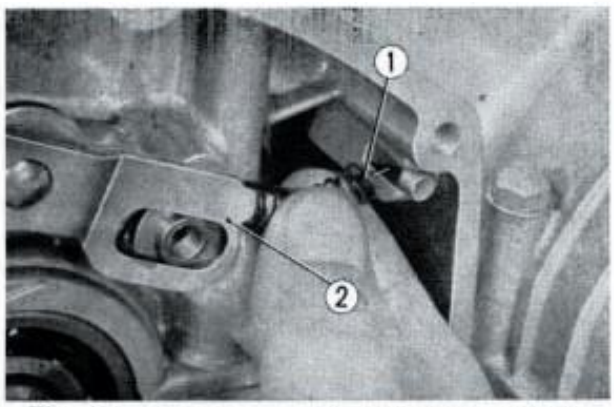


Fig. 131 ① Spring ② Shift drum stopper

8. Install the gear shift arm and make sure that it operates smoothly in both direction.
9. Install the clutch in accordance with section 6. C.

8. CAM CHAIN TENSIONER

The cam chain tensioner is constructed of spring steel on which a layer of heat resistant rubber is vulcanized and a sheet of teflon cemented. It applies pressure against the cam chain and absorbs the shocks produced by the chain. The cam chain guide on the tension side of the cam chain also controls chain vibration.
An adjustment screw is located at the rear of the cylinder block.

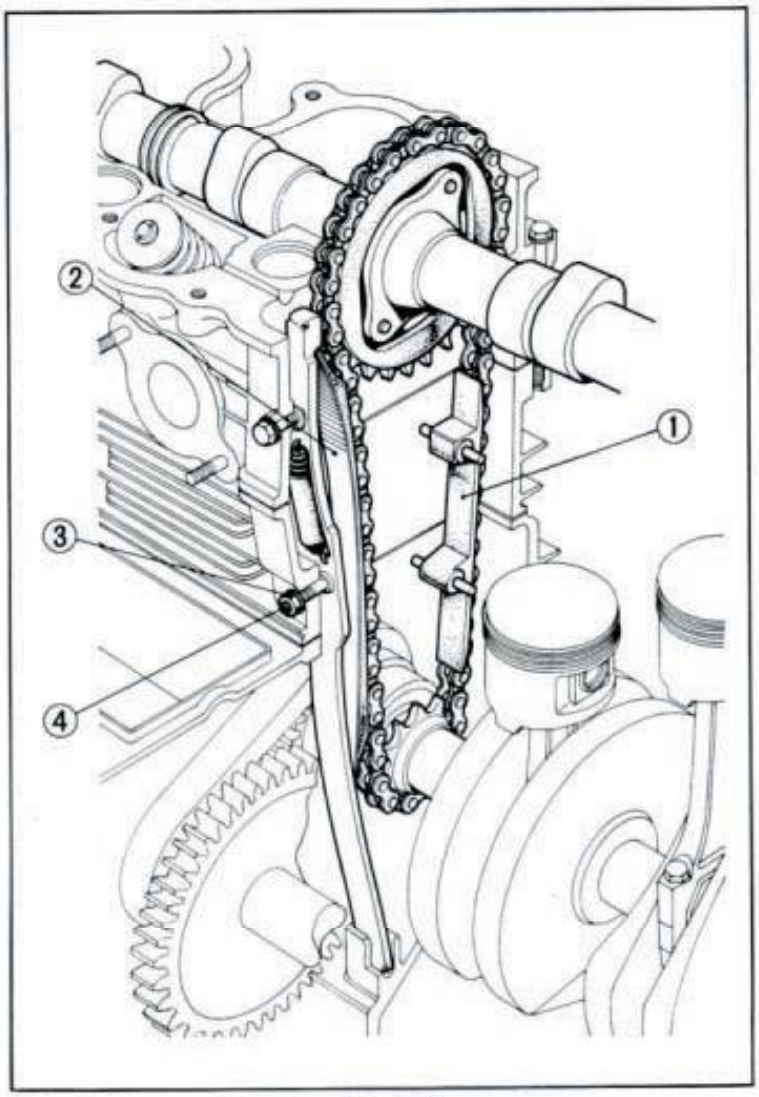


Fig. 132

① Cam chain guide
② Cam chain tensioner
③ Lock nut
④ Screw

Courtesy of Honda4Fun
www.hondafour.com www.honda4fun.com

A. Disassembly

1. Remove the cam chain tensioner and the chain guide in accordance with section 3. A.

B. Inspection

1. Make sure that the gear of the cam chain tensioner adjuster is properly meshed with the rack, and inspect for smooth operation.

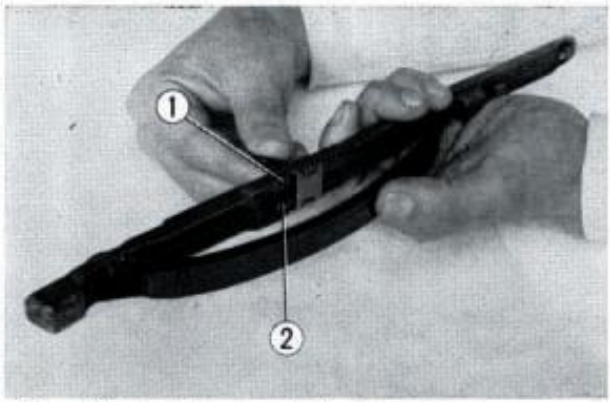


Fig. 133 ① Gear ② Rack

C. Reassembly

1. Perform reassembly in accordance with section 3. C.

9. CRANKSHAFT AND CONNECTING ROD

A. Disassembly

1. Dismount the engine in accordance with section 2. A.
2. Disassemble the cylinder head, cylinder, and piston in accordance with section 3. A.
3. Remove the generator cover and remove the rotor using a generator rotor puller. (Tool No. 07011-21601)
4. Remove the point cover, and the special washer by removing the 6 mm bolt. Next, unscrew the three 5 mm screws and remove the contact breaker assembly and the spark advancer.

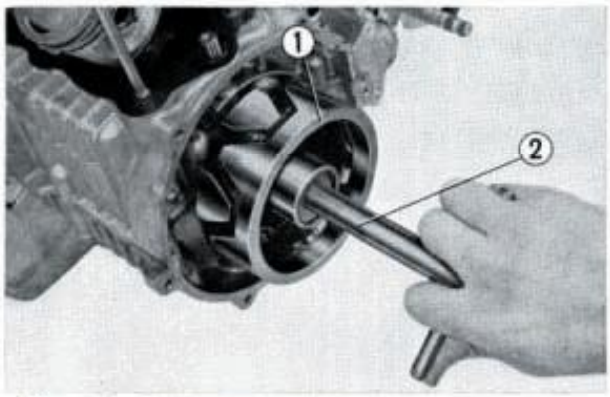


Fig. 134 ① Generator rotor
② Generator rotor puller

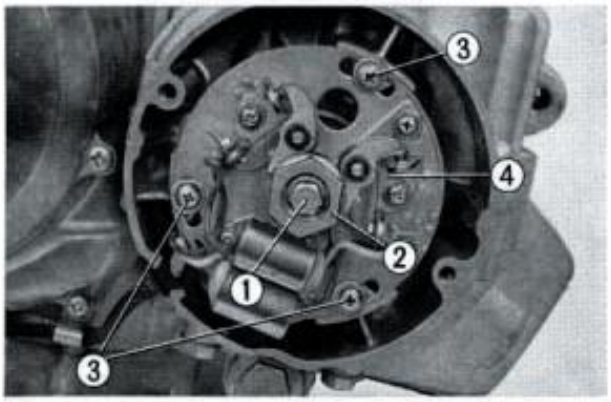


Fig. 135 ① 6 mm bolt
② Special washer
③ 5 mm screws
④ Contact breaker assembly

5. Remove the clutch and the gear shift arm in accordance with section 6. A.
6. Remove the starting motor cover, and dismount the starting motor.

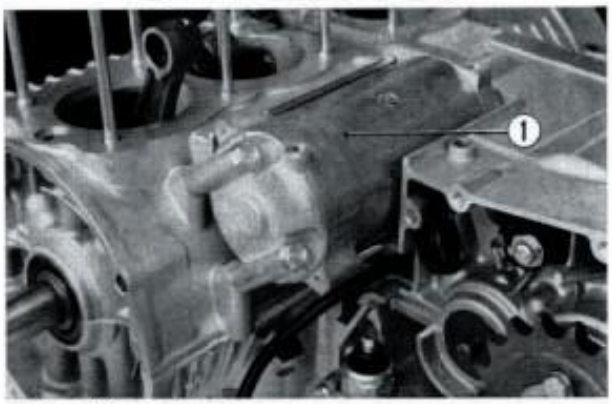


Fig. 136 ① Starting motor

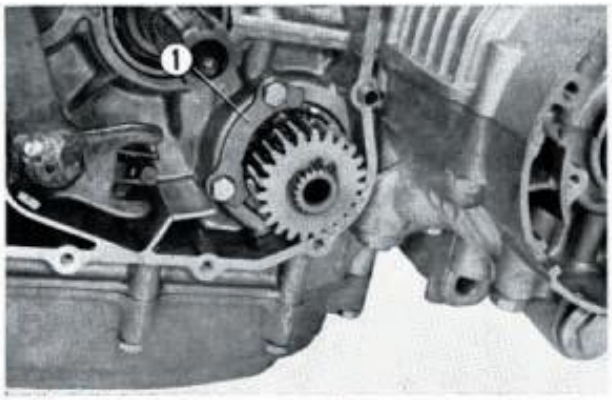


Fig. 137 ① Bearing set plate

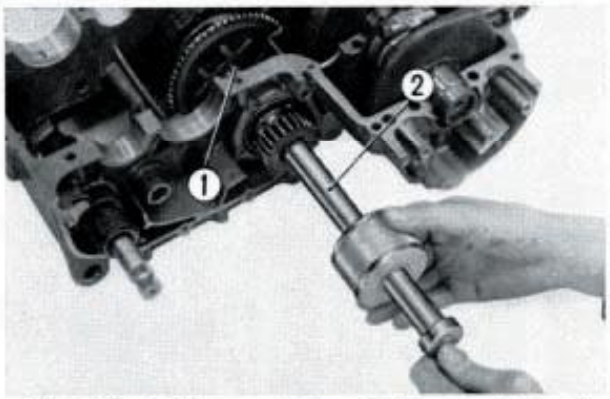


Fig. 138 ① Primary shaft ② Primary shaft puller

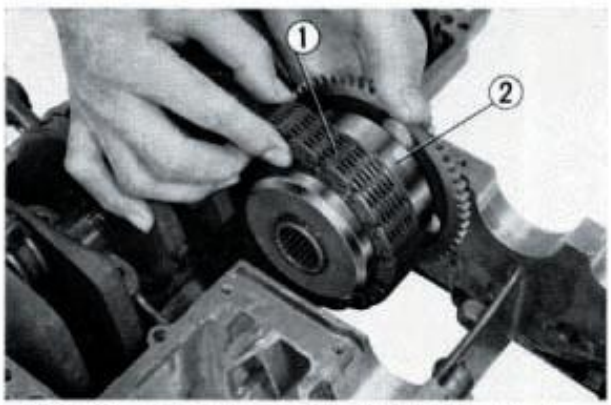


Fig. 139 ① Primary chain ② Starting clutch

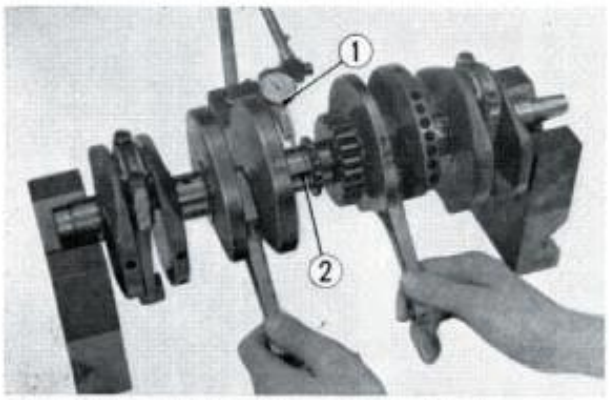


Fig. 140 ① Dial gauge ② Crankshaft

7. Place the engine upside down and unscrew the ten 6 mm bolts to remove the oil pan.
8. Unscrew ten 8 mm bolts and twelve 6 mm bolts from the lower crankcase. Loosen the 8 mm bolts in the reverse order shown in Fig. 151.
9. Then, put the engine in correct position and unscrew three each 8 mm and 6 mm bolts. Tap the upper crankcase lightly with a wooden hammer and separate the upper and lower crankcases.
10. Unscrew two 6 mm bolts and remove the bearing set plate.
11. Pull out the primary shaft using a primary shaft puller (Tool No. 07009-32301).

Note:

Disassembly of the primary shaft, transmission, and kick starter can be performed without removing the cylinder head, cylinder or piston. When removing lower crankcase, follow the sequence 10, 11, 9 and 8 above.

12. Remove the starting clutch from the primary chain.
13. Remove the primary chain and the cam chain from the crankshaft.

B. Inspection

1. Measure crankshaft runout
   Support both ends of the crankshaft on V-block and measure the amount of bend in the crankshaft by applying a dial gauge to the center journal and rotating the crankshaft. If the runout beyonds the serviceable limit on the dial gauge, the crankshaft should be replaced.

2. Inspect the crankshaft journals for scoring and uneven wear with a micrometer. If any journal is out-of-round or tapered more than serviceable limit, the crankshaft should be replaced.

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

3. Measure the crankshaft journal wear.
   Cut a length of plasti gauge to the width of the bearing cap. Place the gauge on the bearing parallel to the crankshaft, assemble the crankshaft and torque down the crankcase in accordance with Fig. 151.
   Disassemble the crankcase and measure the plasti gauge using the scale provided. If there is a clearance in excess of **0.08 mm (0.0031 in.)**, the bearing should be replaced.

Note:
When measuring with the plasti gauge, do not turn the crankshaft.

Selection of The Bearing

1. Remove the bearing, assemble and tighten the upper and lower crankcases. Refer to Fig. 151.
2. Measure the inside diameter of all the bearing seats in the vertical direction with a cylinder gauge and select out the corresponding alphabet from the table below.

mm (in.)

C	36.016~36.024 (1.4179~1.4182)
B	36.008~36.016 (1.4176~1.4179)
A	36.000~36.008 (1.4173~1.4176)

3. Measure the diameter of all the crankshaft journal with a micrometer and also select out the corresponding figure 1 or 2 from the table below.

1	2
32.99~33.00 (1.2987~1.2992)	32.98~32.99 (1.2983~1.2987)

4. According to the alphabet and the figure from item 2 and 3, pick out the proper bearing from A, B, C and D.

Crankshaft classification No. / Crankcase classification mark	1	2
C	B (Brown)	A (Black)
B	C (Green)	B (Brown)
A	D (Yellow)	C (Green)

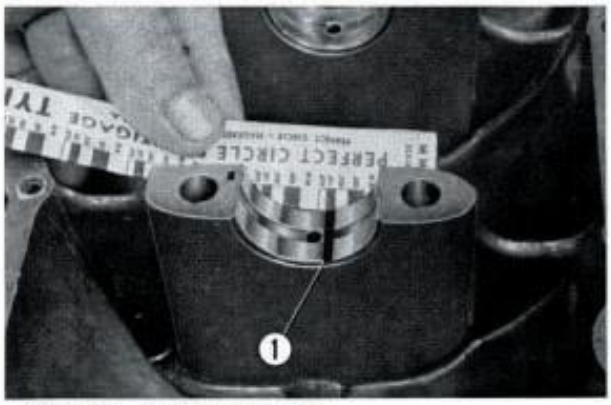


Fig. 141 ① Plasti gauge

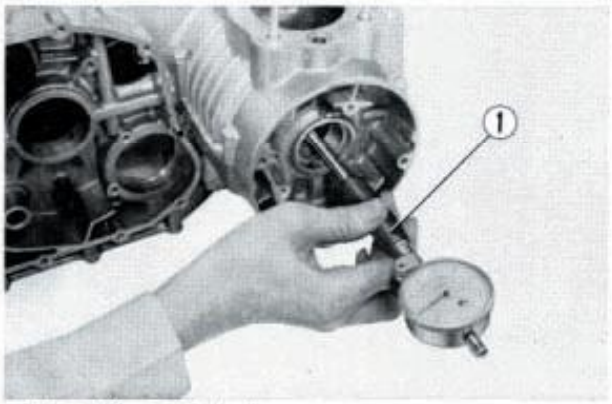


Fig. 142 ① Cylinder gauge

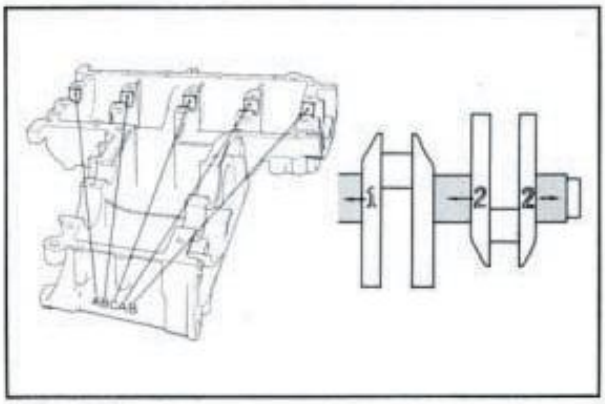


Fig. 143

Note:
The lower crankcase and crankshaft are marked with letters or number at the factory. These are production codes and should not be used or refered to during servicing or repair.

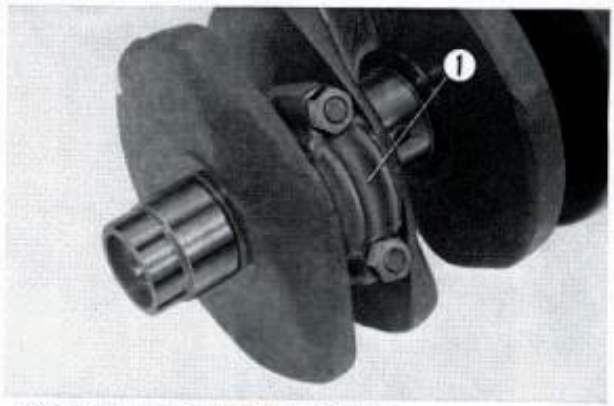


Fig. 144 ① Connecting rod cap

5. Measure connecting rod large end wear. Separate the cap from the connecting rod and after setting the plasti gauge in place, torque the two rod nuts to **2.0–2.2 kg-m (14.46–15.91 lbs-ft)**.
   Disassemble the cap and measure the plasti gauge. Replace the bearing with new one if beyond the serviceable limit.

Note:
Do not turn the crankshaft while the plasti gauge is installed.

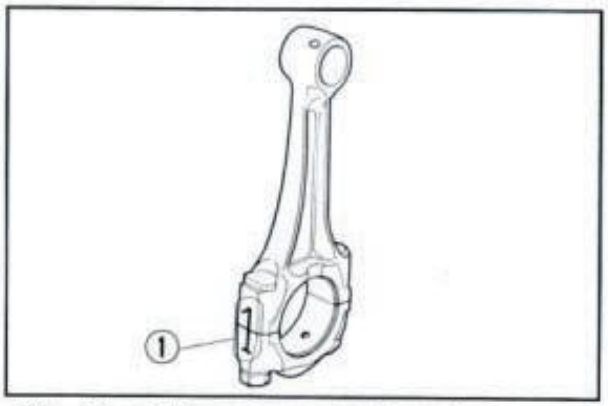


Fig. 145 ① Connecting rod code number

Selection of The Bearing

1. Measure crankshaft pin diameter with a micrometer and select out the corresponding alphabet from the table below.

A	B
34.99~35.00 (1.3775~1.3780)	34.98~34.99 (1.3771~1.3775)

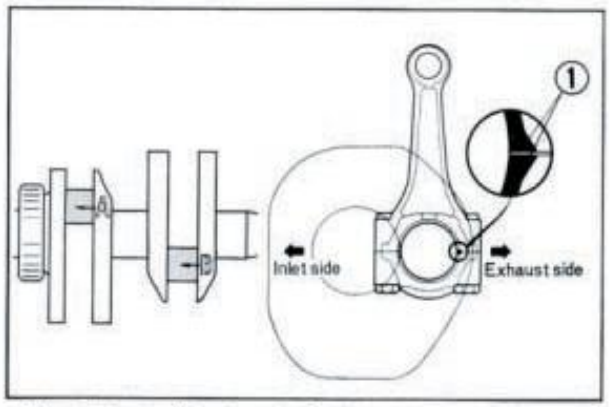


Fig. 146 ① Key (projection)

2. Select out the bearing from the table below which coincides with the number (1, 2, 3) stamped on the large end of the connecting rod.

Crank pin classification mark / Connecting rod code No.	A	B
3	B (Brown)	A (Black)
2	C (Green)	B (Brown)
1	D (Yellow)	C (Green)

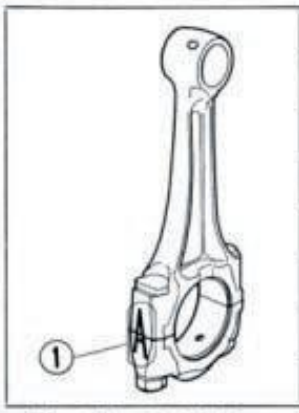
Note:
- **The numbers marked on the crankshaft are production codes and should not be referred to during servicing.**
- **The bearings must be installed on the connecting rod with the key toward the front.**

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

6. Method of designating connecting rod weight.
   When replacing connecting rod, replace with one having the same weight code. The weight code is stamped at the large end of the connecting rod. When replacing all of the connecting rods, the tolerance of the respective rods should be within 5 grams.

Note:
In the connecting rod weight, that weight of cap and two bolts are included but does not include the bearings.

7. Measure axial clearance using a feeler gauge.
   Replace if beyond the serviceable limit



Code	Weight (gr.)
A	281~285
B	286~290
C	291~295
D	296~300
E	301~305
F	306~310
G	311~315

Fig. 147 ① Weight code number

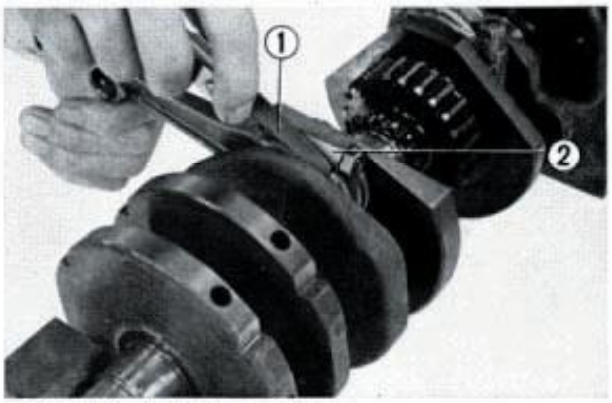


Fig. 148 ① Feeler gauge
② Connecting rod

8. Measure the connecting rod small end.
   Measure the diameter of the connecting rod small end with an inside dial gauge. Replace if beyond serviceable limit.

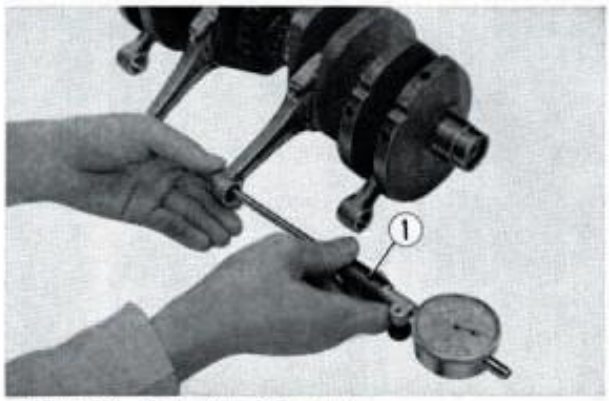


Fig. 149 ① Inside dial gauge

C. Reassembly

1. Install the primary chain and cam chain on the crankshaft.
2. Install the crankshaft into the lower crankcase.
3. Position the starting clutch and starter gear as in Fig. 150, then drive the primary shaft in from the right to left. Exercise care in the needle bearing assembly sequence shown in Fig. 165.

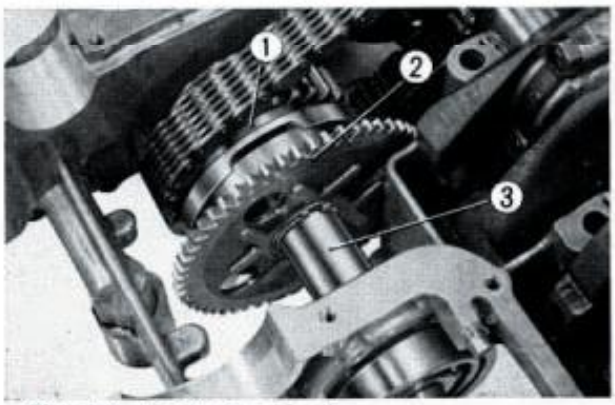


Fig. 150 ① Starting clutch
② Starter gear ③ Primary shaft

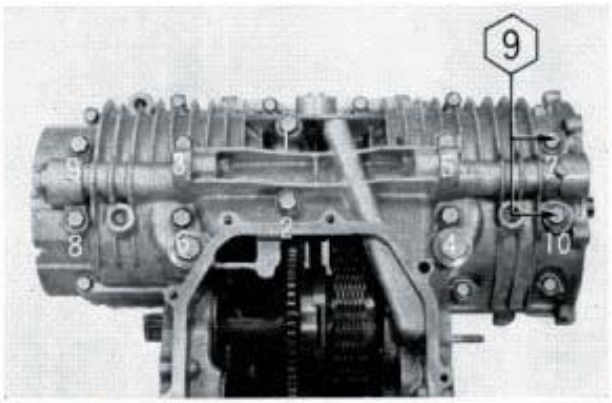


Fig. 151 8 mm mounting bolts

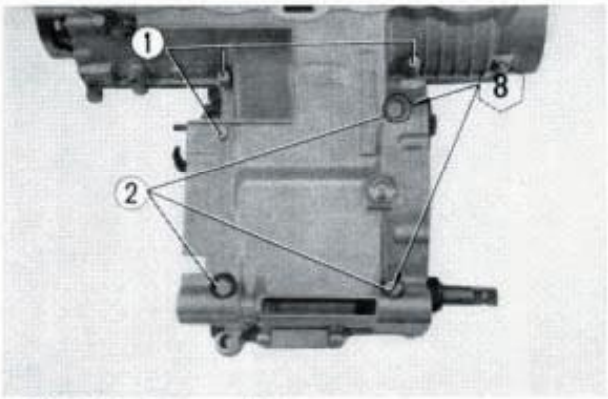


Fig. 153 ① 6 mm bolts
② 8 mm bolts

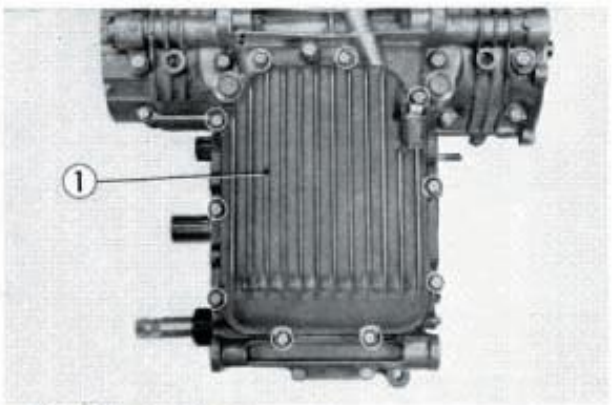


Fig. 154 ① Oil pan

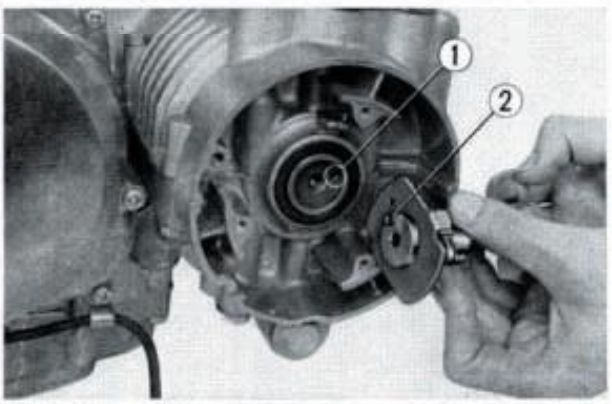


Fig. 155 ① Dowel pin hole ② Dowel pin

4. Install the bearing set plate with two 6 mm bolts.
5. Apply a thin coat of gasket paste on the mounting flange of the lower crankcase (heavy coat will cause the paste to fall inside the crankcase).
   Install two dowel pins, mount the upper crankcase on the lower crankcase.

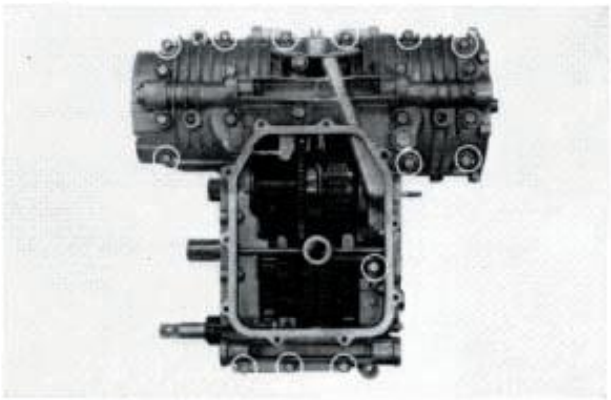


Fig. 152 6 mm mounting bolts

6. Place the engine upside down so as not to separate the parting surfaces by holding them by hands and install the ten 8 mm bolts. Torque the 8 mm bolts in the sequence shown in Fig. 151 to a torque of **2.3–2.5 kg-m**. (**16.63–18.08 lbs-ft**).
   Next, tighten thirteen 6 mm bolts. (Fig. 152)

Note:
Note position of the two 8 mm bolts which are stamped on the bolt head with numeral "9".

7. Position the upper crankcase on top and install with three each, 6 mm and 8 mm bolts. (Fig. 153)

Note:
Note position of the two 8 mm bolts which are stamped on the bolt head with numeral "8".

8. Install the oil screen filter and mount the oil pan with ten 6 mm bolts.
9. Mount the starting motor with two 6 mm screws.
10. Install the gear shift arm in accordance with section 7. C.
11. Install the clutch in accordance with section 6. C.
12. Insert the spark advancer dowel pin into the pin hole in the crankshaft, and then mount the contact breaker with three 5 mm screws.

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

13. Install the special advancer washer with the 6 mm bolt, and install the point cover.
14. Mount the generator rotor with the 16 mm bolt.
15. Install the generator cover.
15. Assemble the piston, cylinder, cylinder head, and head cover in accordance with section 3. C.

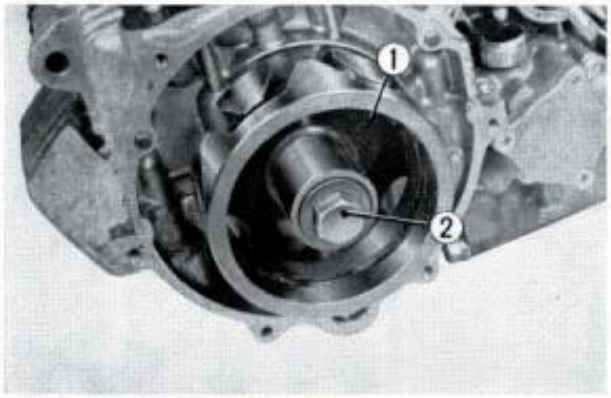


Fig. 156 ① Generator rotor
② 16 mm bolt

10. TRANSMISSION, KICK STARTER AND PRIMARY SHAFT

A. Disassembly

1. Dismount the engine from the frame in accordance with section 2. A.
2. Remove the clutch in accordance with section 6. A.
3. Separate the upper and lower crankcase in accordance with section 9. A.
4. Remove the transmission and disassemble the gears from the respective shafts.

Kick Starter

5. Remove the 18 mm snap ring and the return spring.
6. Remove the 12 mm snap ring and disassemble the kick starter shaft from the lower crankcase.

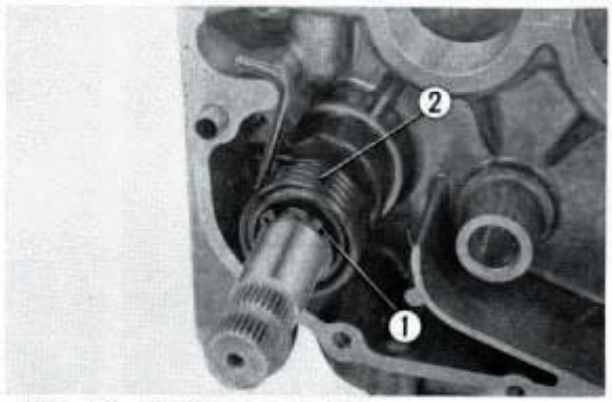


Fig. 157 ① 18 mm snap ring
② Return spring

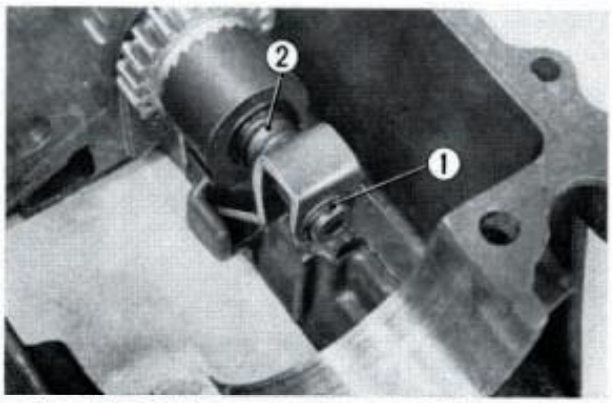


Fig. 158 ① 12 mm snap ring ② Kick starter shaft

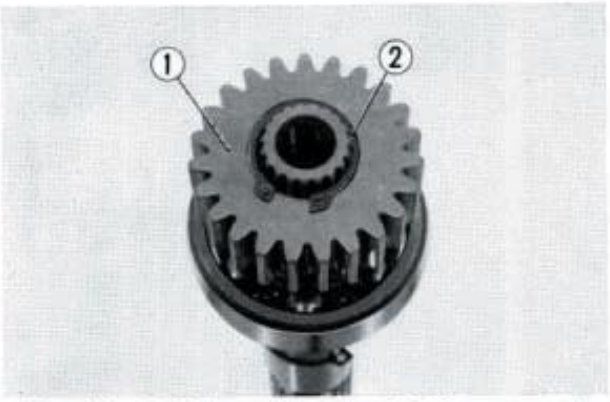


Fig. 159 ① Primary drive gear ② 20 mm snap ring

Primary Shaft

7. Remove the primary shaft in accordance with section 9. A, and remove the 20 mm snap ring and primary drive gear.

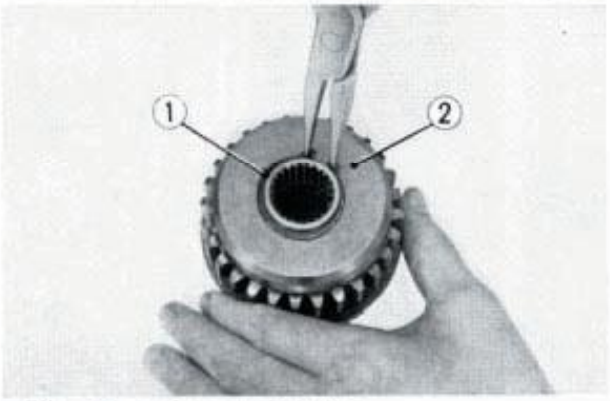


Fig. 160 ① 30 mm snap ring
② Primary driven sprocket

8. Remove the side collar and pull out the # 6205 ball bearing.
9. Remove the 30 mm snap ring, primary driven sprocket, starting clutch, and pull out the damper rubbers.

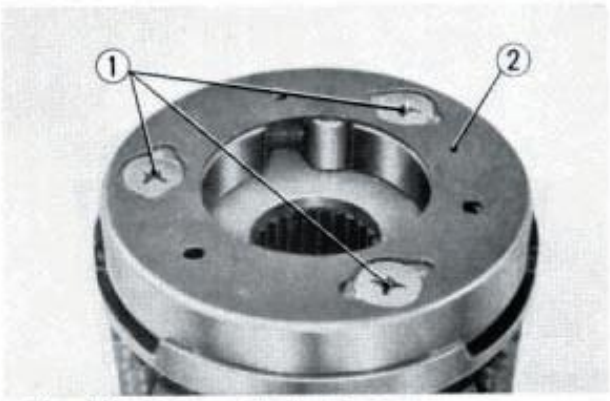


Fig. 161 ① 6 mm flat head screws
② Starting clutch outer

10. Unscrew the three 6 mm flat head screws and remove the starting clutch outer.

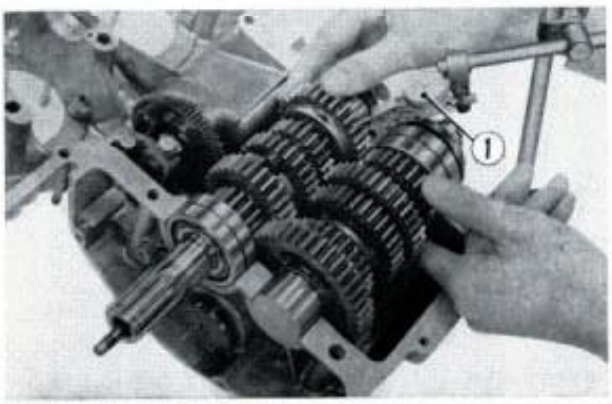


Fig. 162 ① Dial gauge

B. Inspection

1. Measure gear backlash.
Set the pointer of a dial gauge against the tooth of the gear and measure the backlash.

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

2. Inspect the dogs and replace any gears with excessively worn dogs. Also, make sure that the gears slide smoothly over the splined shaft.

C. Reassembly

Primary Shaft

1. Install the starting clutch outer and primary driven sprocket hub with the three 6 mm flat head screws coated with thread lock cement, and then stake the screw heads with a punch to prevent loosening.

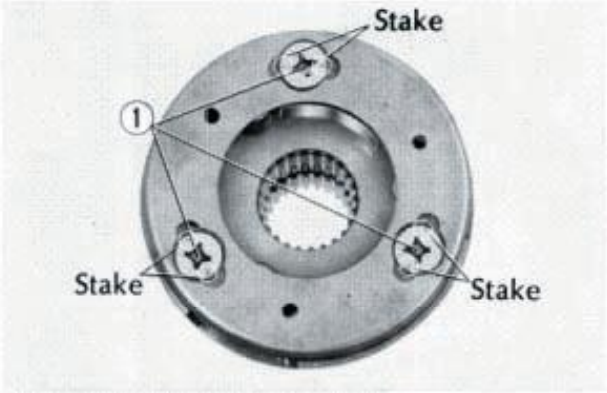


Fig. 163 ① 6 mm flat head screw

2. Assemble the damper rubbers on the primary driven sprocket, and install on the starting clutch with 30 mm set ring.
3. Drive the #6205 ball bearing into the primary shaft.

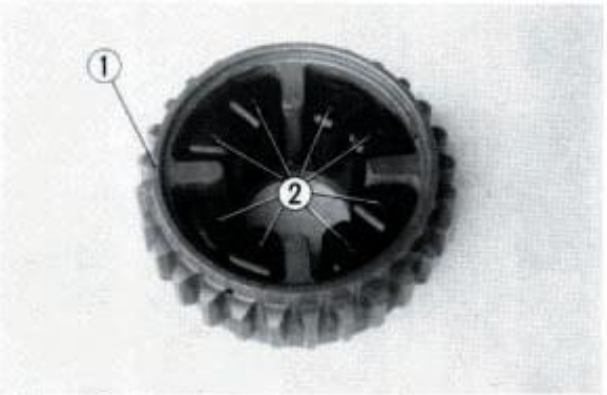


Fig. 164 ① Primary driven sprocket
② Damper rubbers

4. Mount the starting clutch gear on the starting clutch, insert the needle bearing and 25 mm spacer into the starting clutch gear, fit the 25 mm thrust washer and the snap ring on the primar shaft, and install the primary shaft in the crankcase.

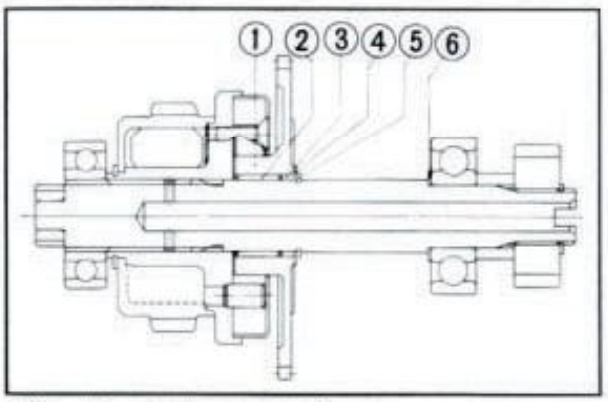


Fig. 165 ① Starting clutch gear
② Needle bearing (25×29×17)
③ 25 mm spacer
④ 25 mm thrust washer
⑤ 25 mm snap ring
⑥ 22 mm thrust washer

Kick Starter

5. Reassemble the kick starter components in accordance with Fig. 166.

Note:
Do not forget to install the 18 mm washer.

Transmission

6. Assemble the transmission gears on the respective main and counter shafts.

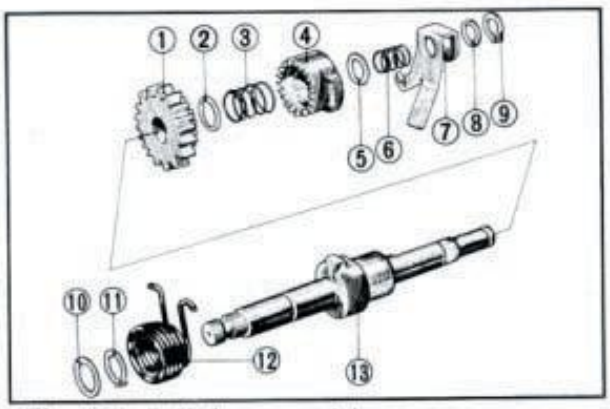
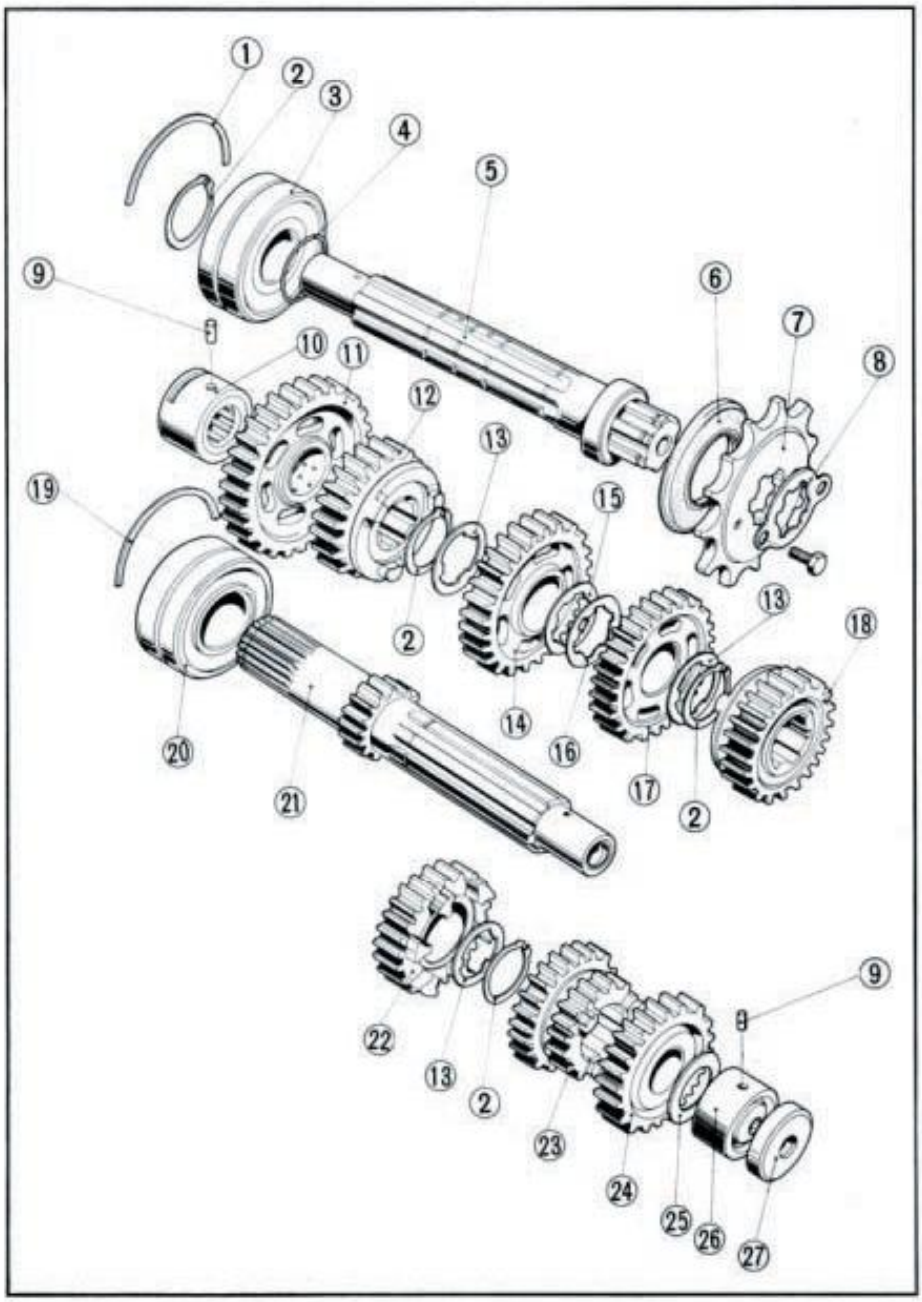


Fig. 166
① Kick starter pinion
② 20 mm thrust washer
③ Starter pinion set spring
④ Kick starter rachet
⑤ 15 mm thrust washer
⑥ Kick starter rachet spring
⑦ Rachet guide plate
⑧ Chain guide thrust
⑨ 12 mm snap ring
⑩ 18 mm washer
⑪ 18 mm snap ring
⑫ Kick starter spring
⑬ Kick starter spindle



① 57 mm bearing set ring
② 25 mm snap ring
③ 5205 special ball bearing
④ 24.5 mm O-ring
⑤ Transmission counter shaft
⑥ 33×57×7 oil seal
⑦ Drive sprocket (17T)
⑧ Drive sprocket fixing plate
⑨ Gear shift fork pin
⑩ 20 mm needle bearing
⑪ Counter shaft low gear (40 T)
⑫ Counter shaft fourth gear (29 T)
⑬ 25 mm thrust washer
⑭ Counter shaft third gear (33T)
⑮ 25 mm lock washer
⑯ 25 mm thrust washer
⑰ Counter shaft second gear (36 T)
⑱ Counter shaft top gear (27 T)
⑲ 52 mm bearing set ring
⑳ 5205 HS ball bearing
㉑ Transmission main shaft (24 T)
㉒ Main shaft fourth gear (28 T)
㉓ Main shaft second, third gear (22 T, 26 T)
㉔ Main shaft top gear (30 T)
㉕ 20 mm thrust washer
㉖ 22 mm needle bearing
㉗ 8×34×8 oil seal

Fig. 167

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

7. Install the two each bearing set rings and the dowel pins in the upper crankcase, and install the transmission.
8. Reassemble the upper and the lower crankcase in accordance with section 9. C.
9. Install the clutch in accordance with section 6. C.
10. Mount the engine in the frame in accordance with 2. B.

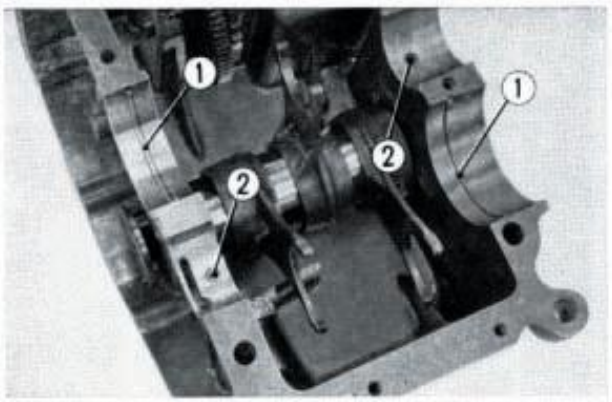


Fig. 168 ① Bearing set rings ② Dowel pins

11. CARBURETOR

A. Disassembly

1. Remove the carburetor unit from the engine in accordance with section 2 A.

Stay Plate And Carburetor

2. Unhook the throttle return spring off the link lever.

Note:
Exercise care not to damage the hook end of the spring.

3. Unscrew the hex. nuts, and remove the dust plate B. Remove the cap nuts.

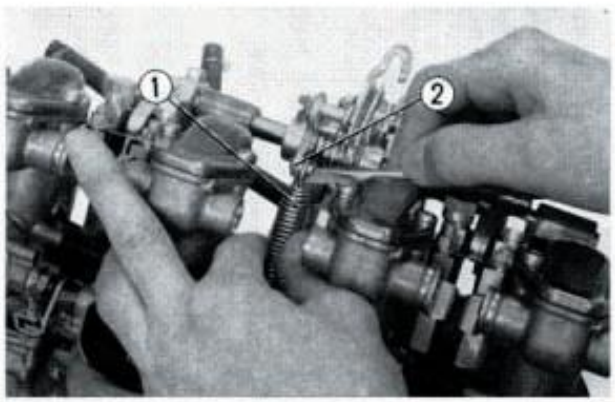


Fig. 169 ① Throttle return spring ② Link lever

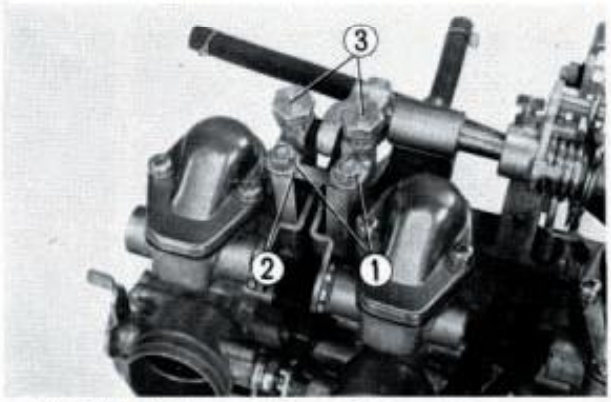


Fig. 170 ① Hex. nuts ③ Cap nuts ② Dust plate B

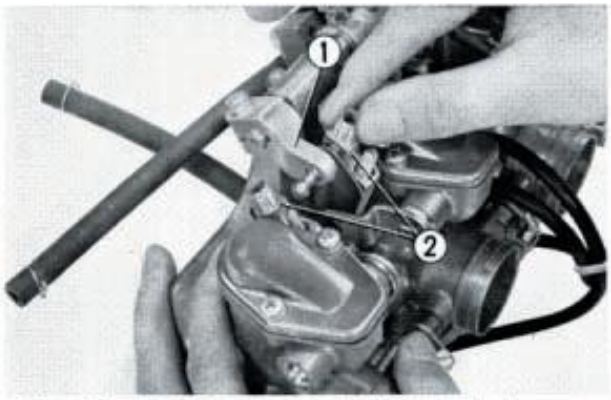


Fig. 171 ① Link arm ② Adjuster holders

4. Remove the adjuster holders from the link arm.
5. Unscrew the eight 6 mm flat head screws from the stay plate and remove the carburetor unit.

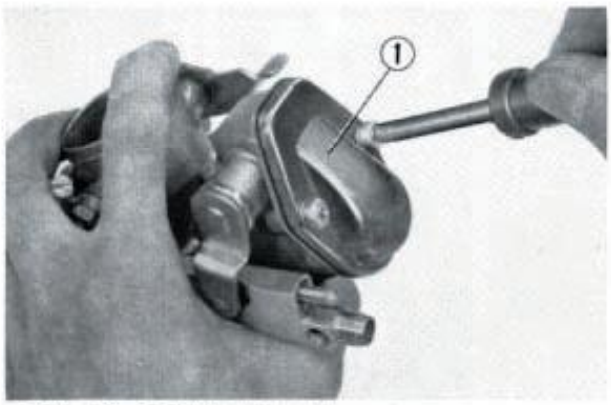


Fig. 172 ① Carburetor top

Throttle Valve And Jet Needle

6. Unscrew the two carburetor top mounting screws from each carburetor and remove the tops.

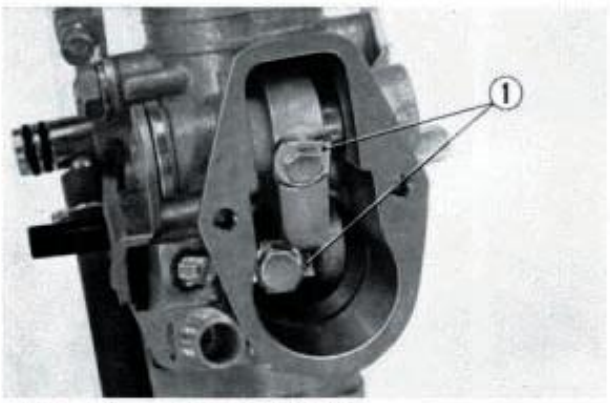


Fig. 173 ① Tongued washer

7. Position the throttle valve to full open and straighten the tab of the two tongued washers.

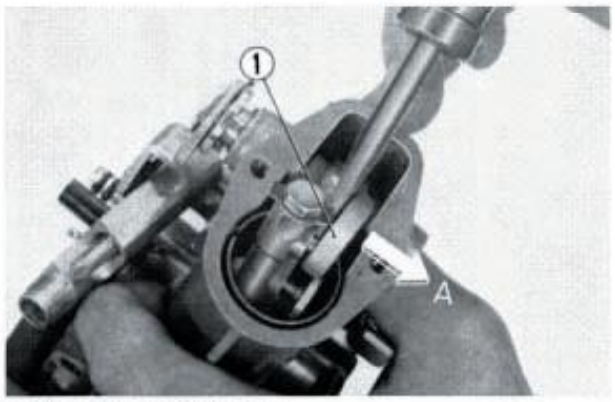


Fig. 174 ① Link arm

8. Remove the 6 mm bolt from the shaft end and remove the link arm in direction A using a screw driver.

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

9. Loosen the 6 mm bolt on the throttle side about 1/2 turn, insert a screwdriver between the throttle shaft and link arm and pry loose in direction A.

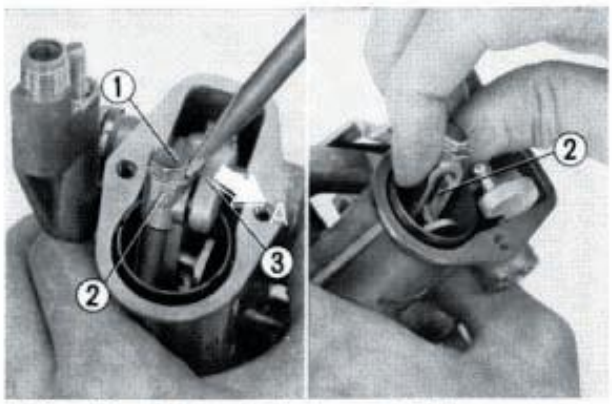


Fig. 175 ① 6 mm bolt ② Throttle shaft ③ Link arm

10. Unscrew the two 3 mm screws, rotate the valve plate 90° in either direction and align the tab on the valve plate to the groove in the shaft, and remove the valve plate.
11. Remove the jet needle from the throttle valve.

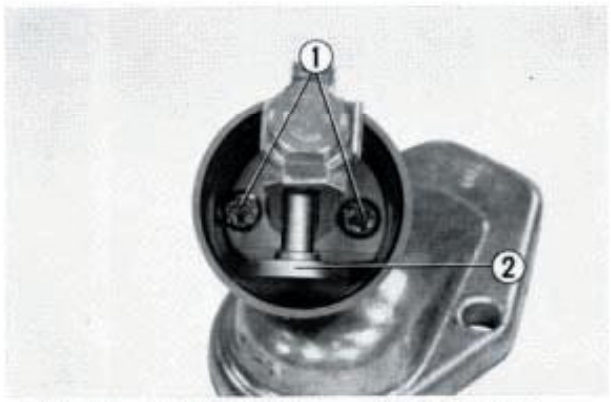


Fig. 176 ① 3 mm screws ② Valve plate

Adjuster Holder

1. Remove the carburetor from the stay plate in accordance with section 1~5.
2. Remove the adjusting screw from the adjuster holder.

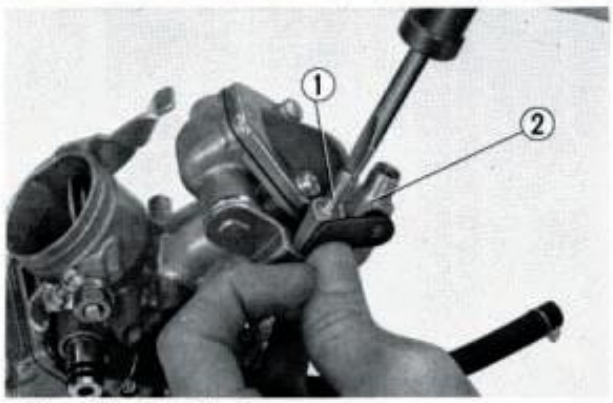


Fig. 177 ① Adjusting screw ② Adjuster holder

3. Position the throttle valve at the intermediate position and remove the adjuster holder.

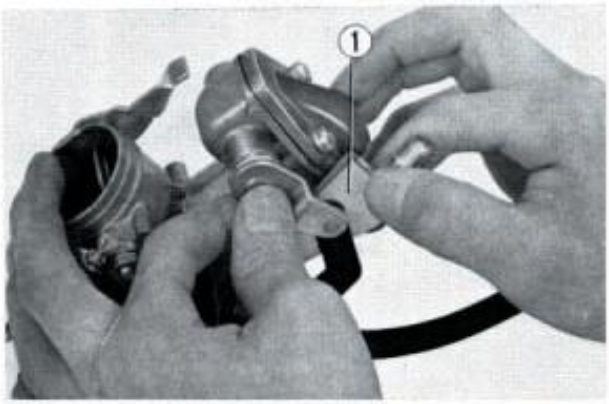


Fig. 178 ① Adjuster holder

Courtesy of Honda4Fun
www.hondafour.com www.honda4fun.com

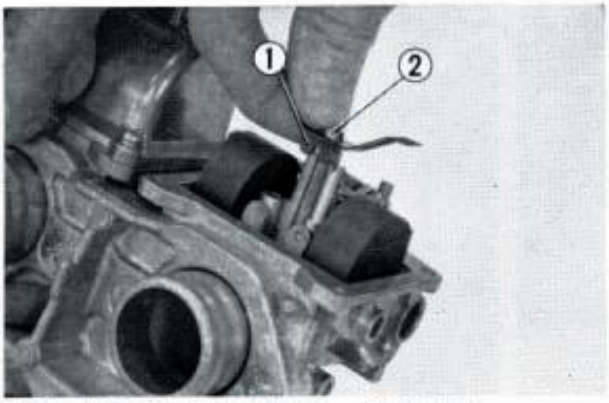


Fig. 179 ① Leaf spring ② Main jet

Float, Main Jet, And Slow Jet

1. Remove the float chamber body.
2. Remove the leaf spring and the main jet.

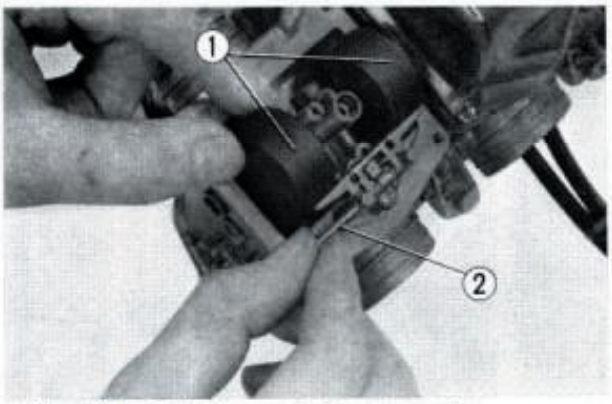


Fig. 180 ① Float ② Float arm pin

3. Pull out the float arm pin and remove the float.

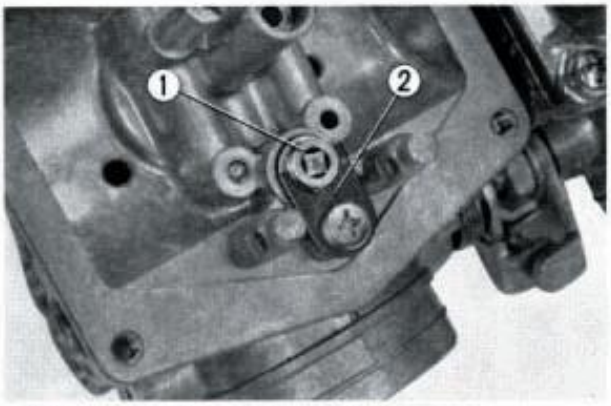


Fig. 181 ① Valve seat ② Clip plate

4. Disengage the clip plate and remove the valve seat.

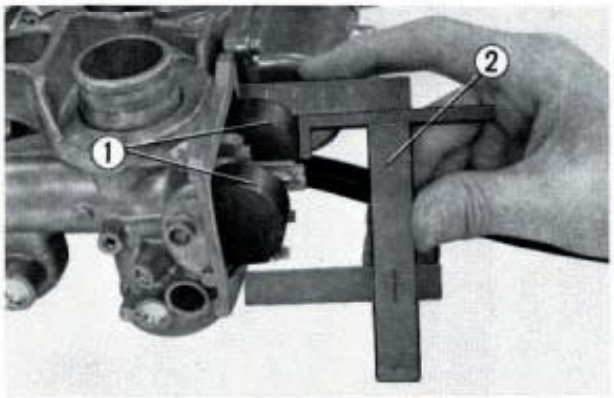


Fig. 182 ① Floats ② Float level gauge

B. Inspection

1. Fuel level adjustment.
   Position the float so that the float arm barely touches the tip of the float valve. Measure the distance from the flange to the top of the float with the float level gauge. The standard value is **22 mm (0.89 in.)**

Courtesy of Honda4Fun
www.hondafour.com www.honda4fun.com

C. Reassembly

Float, Main Jet, And Slow Jet

1. Install the valve seat with the clip plate.
2. Install the float.
3. Place the leaf spring on the main jet, and install them on top of the needle jet holder.
4. Install the float chamber body.

Carburetor setting data	
Description	No.
Main jet	# 100
Air jet	# 150
Slow jet	# 40
Throttle valve	# 2.5
Air screw opening	1±1/8

Adjuster Holder

1. Insert the coil spring B and spring seat B into the adjuster holder. Position the throttle valve to about 1/2 open and insert approximately 1/4 of the connector shaft into the holder window. Install them while holding the spring seat down with a thin screwdriver.
2. Mount the carburetor on the stay plate in accordance with section 7 and 8.

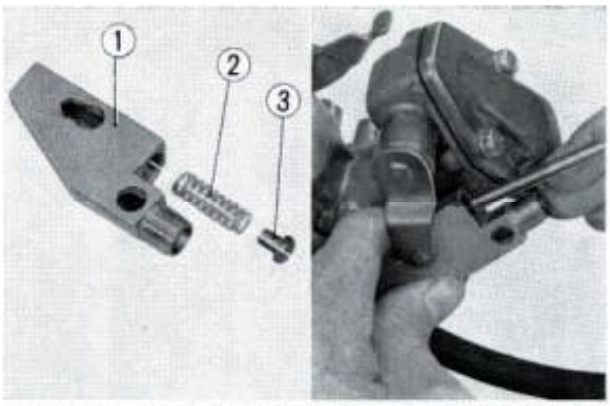


Fig. 183 ① Adjuster holder ② Coil spring B ③ Spring seat B

Throttle Valve And Jet Needle

1. Install the jet needle on the throttle valve.
2. Place two each spring washers and 3 mm screws on the valve plate, and then place the tab of the valve plate to the slot of the throttle valve and push down to the bottom. Then rotate the valve plate 90° toward the link arm and install the 3 mm screws.

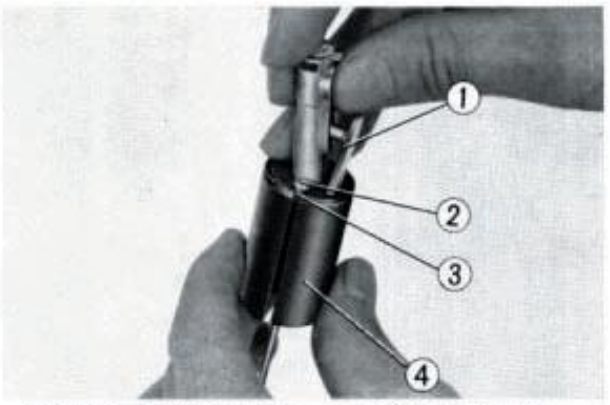


Fig. 184 ① Valve plate ② 3 mm screw ③ Spring washer ④ Throttle valve

3. Install the throttle valve in the carburetor body so that the throttle valve cutaway section is toward the choke valve.

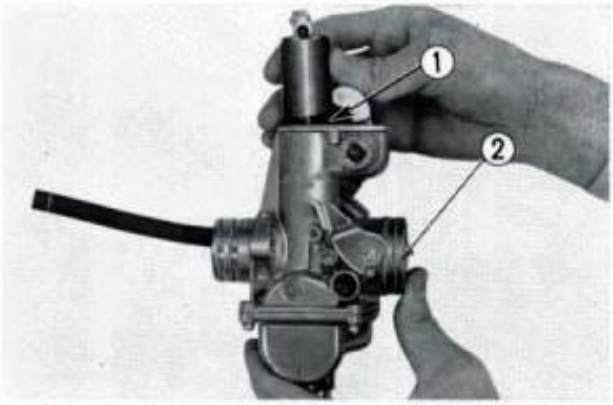


Fig. 185 ① Cutaway section ② Choke valve

Courtesy of Honda4Fun
www.hondafour.com www.honda4fun.com

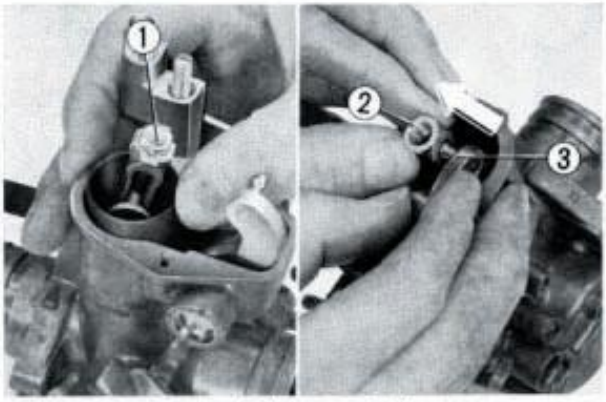


Fig. 186 ① 6 mm bolt ③ Link arm
② Throttle shaft

4. Unscrew the 6 mm bolt from the throttle shaft and push the spherical end of the link arm into the throttle shaft while pulling up the throttle shaft.

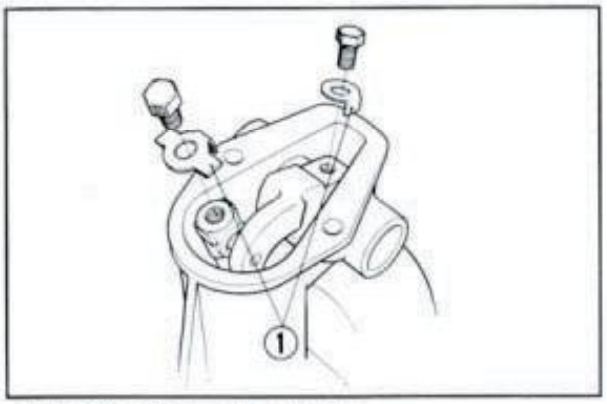


Fig. 187 ① Tongued washer

5. Install the tongued washer with the tongue positioned as shown in Fig. 187, tighten the 6 mm bolt, and then bend up the washer tongue against the bolt head.
6. Install the carburetor top with the two 5 mm screws.

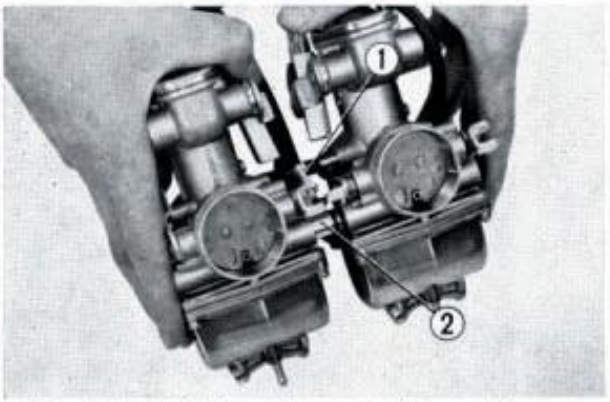


Fig. 188 ① Rubber pipe ② T type joint

7. Combine the two carburetors with the T type joint and the rubber pipe.

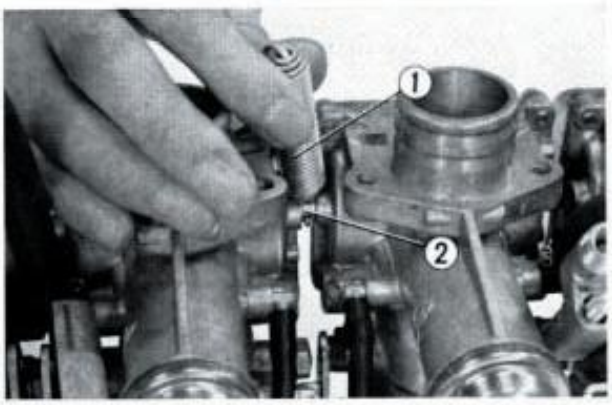


Fig. 189 ① Return spring ② Spring set plate

8. Mount the spring set plate, and then hook up the return spring.
Position the four carburetors, install the set plate, and tighten with the eight 6 mm flat head screws.

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9. Install the dust plate A, and mount the adjuster holder to the link arm.

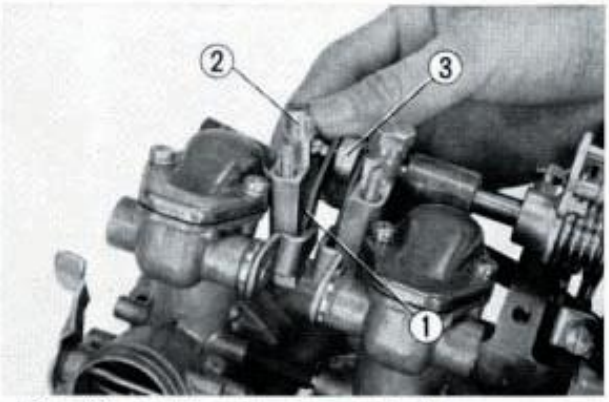

Fig. 190 ① Dust plate A ③ Link arm
② Adjuster holder

10. Insert the coil spring B and tighten it with the cap nut.

Fig. 191 ① Coil spring B ② Cap nut

11. Install the special washer D, dust plate B, and flat washer on the adjuster screw and tighten with the nuts.

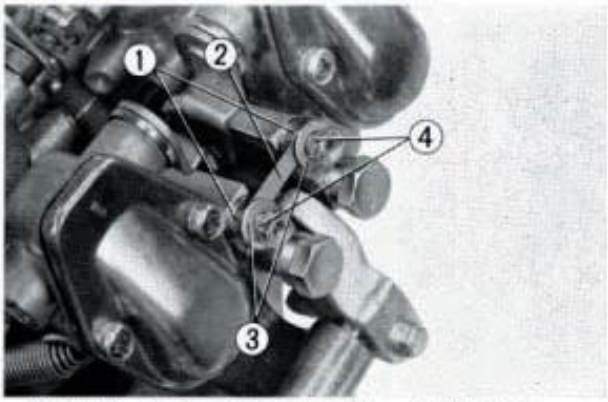

Fig. 192 ① Special washer D ③ Washers
② Dust plate B ④ Nuts

12. Connect the throttle return spring on the link lever, being careful not to damage the hook.
13. Install and route the two fuel tubes as shown in Fig. 193.
14. Mount the carburetor unit on the engine in the reverse order as described in section 2. A.

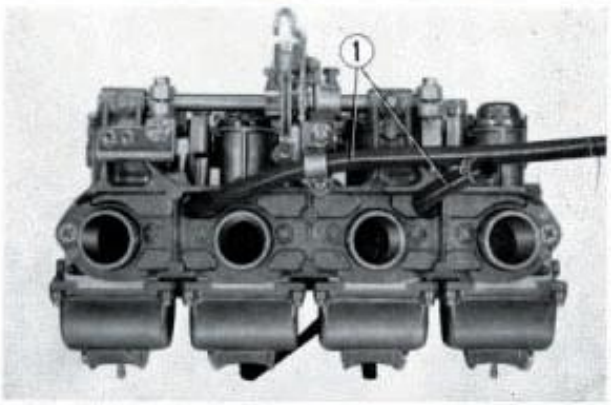

Fig. 193 ① Fuel tubes

Courtesy of Honda4Fun
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1. FRONT WHEEL AND FRONT BRAKE

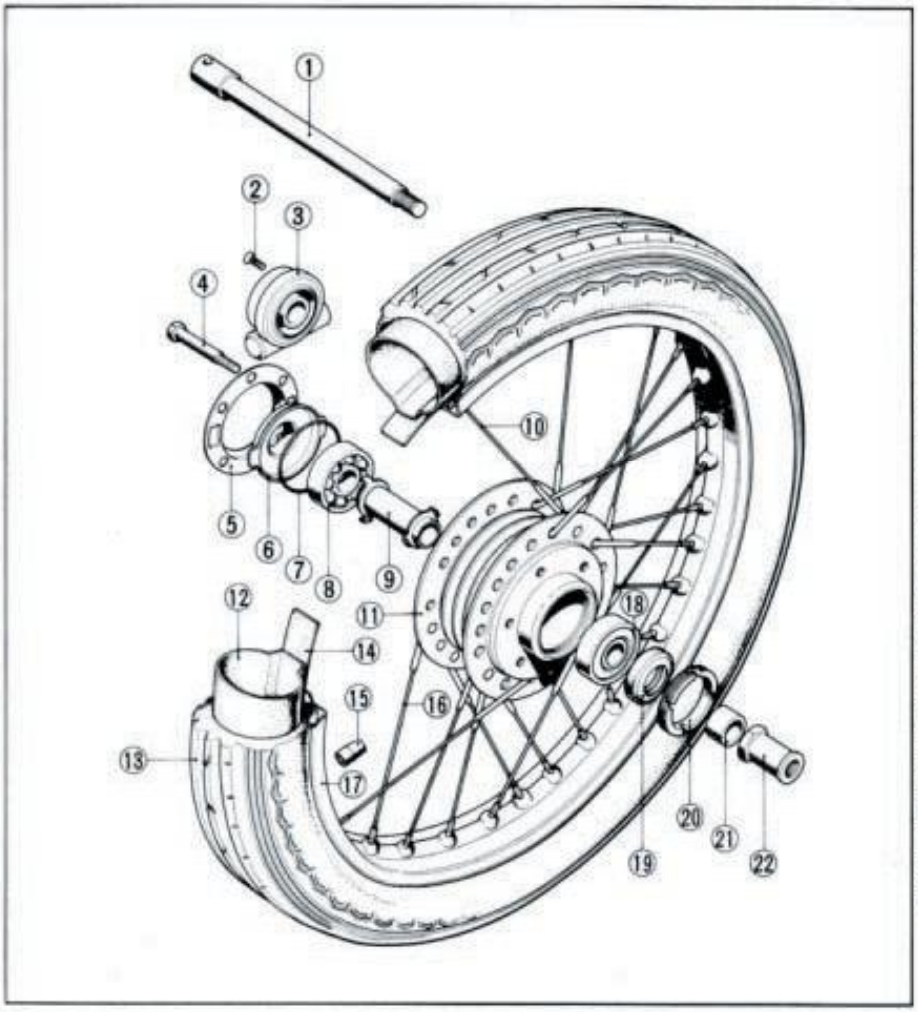

Fig. 194

① Axle shaft
② 5×15 mm oval screw
③ Speedometer gear box
④ 8×102 mm bolt
⑤ Gear box retainer cover
⑥ Gear box retainer
⑦ O-ring
⑧ 6302 R ball bearing
⑨ Front axle distance collar
⑩ Front spoke B
⑪ Front wheel hub
⑫ Front wheel tube
⑬ Front wheel tire
⑭ Front tire flap
⑮ Wheel balancer
⑯ Front spoke A
⑰ Front wheel rim
⑱ 6302 R ball bearing
⑲ 22368 dust seal
⑳ Front wheel bearing retainer
㉑ Front wheel collar
㉒ Front wheel axle nut

Front Wheel

A. Disassembly

1. Place a suitable block under the engine to raise the front wheel off the ground.
2. Disconnect the speedometer cable from the speedometer gear box.
3. Unscrew the axle holder mounting nuts and remove the front wheel assembly from the front fork.
4. Unscrew the front wheel axle nut and remove the front axle.

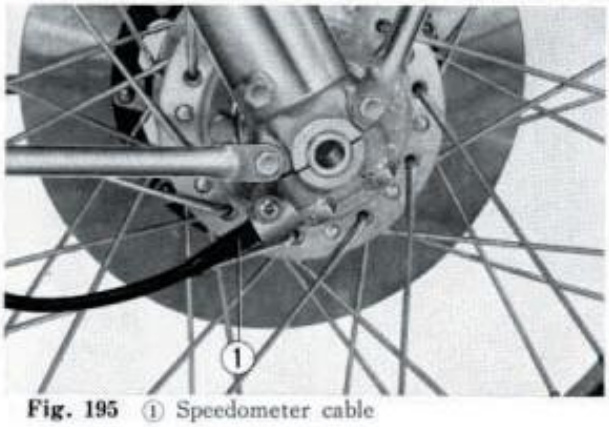

Fig. 195 ① Speedometer cable

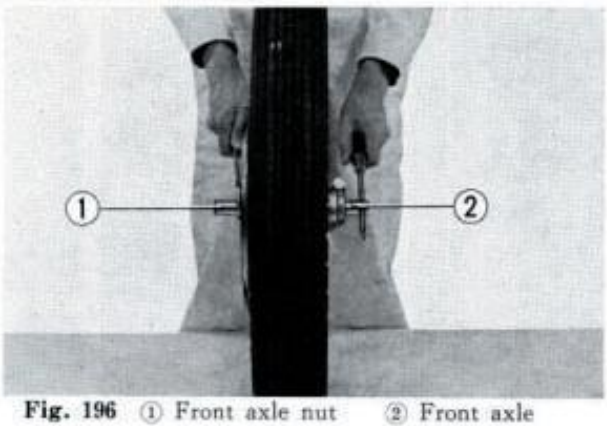

Fig. 196 ① Front axle nut ② Front axle

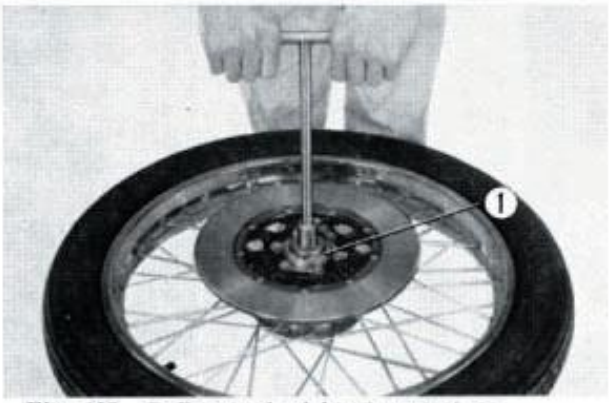

Fig. 197 ① Front wheel bearing retainer

5. Remove the bearing retainer from the wheel hub, and the dust seal from the bearing retainer.

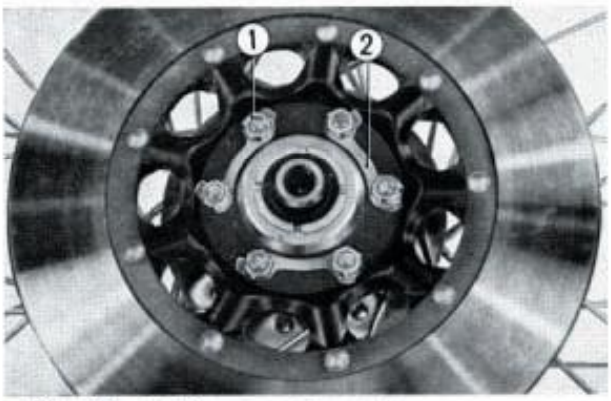

Fig. 198 ① Disc mounting nuts
② Tongued washers

6. To remove the brake disc from the wheel, first, straighten the tongues on the tongued washers, and unscrew the disc mounting nuts.
7. Remove the speedometer gear box and retainer cover from the opposite side.
8. Remove the front wheel bearing.

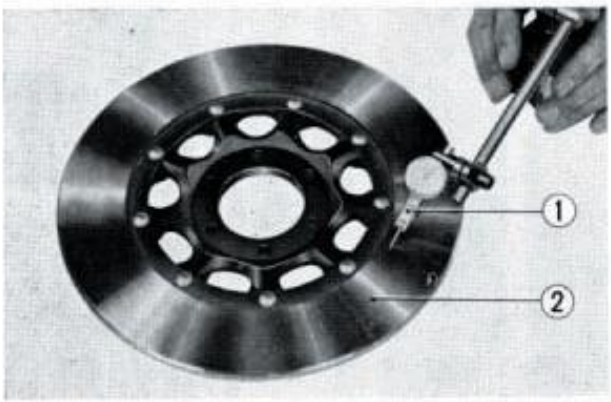

Fig. 199 ① Dial gauge ② Front brake disc

B. Inspection

1. Checking the brake disc.
Place the disc on a surface plate and measure the trueness using a dial gauge as shown in Fig. 199. Replace the disc if beyond the serviceable limit.

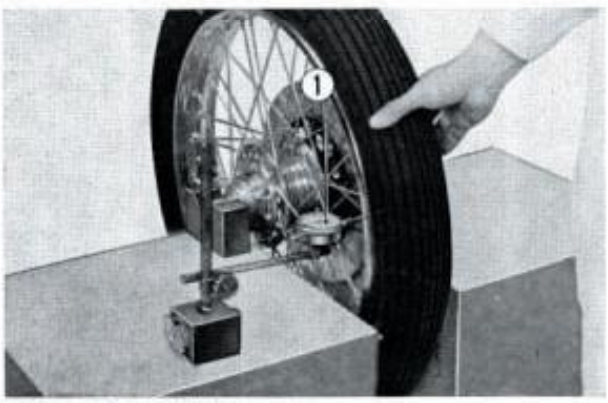

Fig. 200 ① Dial gauge

2. Checking rim wobble and wheel runout.
Spin the wheel by hand and check both wobble and runout using a dial gauge as shown in Fig. 200.

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3. Checking the wheel bearings.
   Measure bearing wear in both axial and radial directions.
4. Check for loose or bent spokes.
   Tighten loose spokes, and straighten or replace bent spokes.
5. If tire pressure is low, check for leaks around the valve stem and also the valve.
6. Check the condition of the tire both inside and outside for cuts, bruises, and imbedded nails.

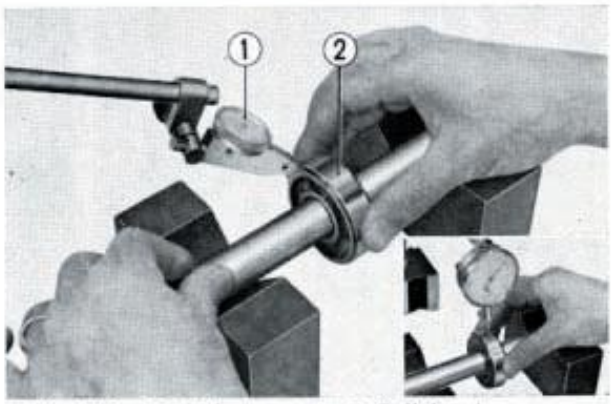

Fig. 201 ① Dial gauge ② Ball bearing

C. Reassembly

1. Drive the 6302R wheel ball bearing into the hub using a bearing driver.
2. Install the dust seal in the wheel bearing retainer, mount the retainer into the wheel hub, and install the O-ring into the hub.

Fig. 202 ① Bearing driver

3. Install the gear box retainer cover on the gear box retainer so that the cover matches the slot.

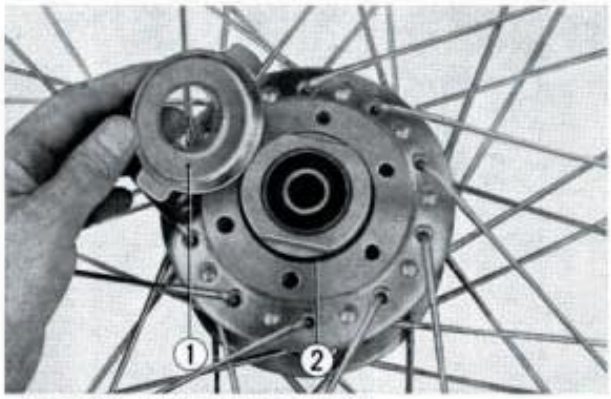

Fig. 203 ① Gear box retainer
② O-ring

4. Mount the brake disc on the wheel with bolts, tongued washers, and nuts. After tightening, bend up the tongues on the washers to lock the nuts.

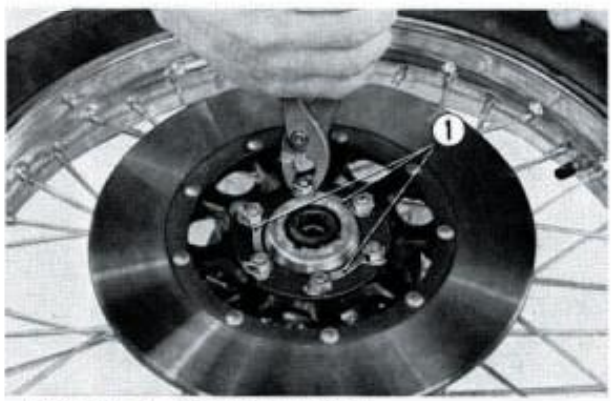

Fig. 204 ① Tongued washers

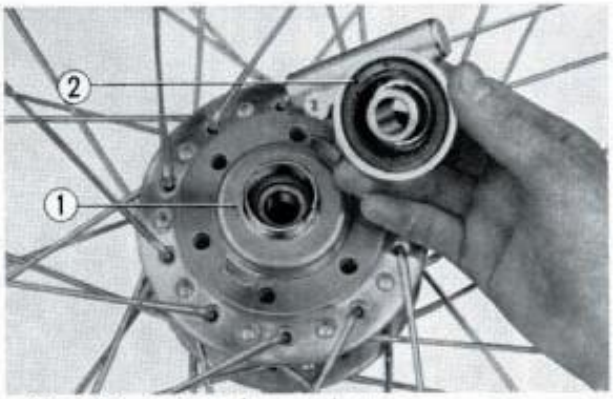

Fig. 205 ① Gear box retainer
② Speedometer gear box

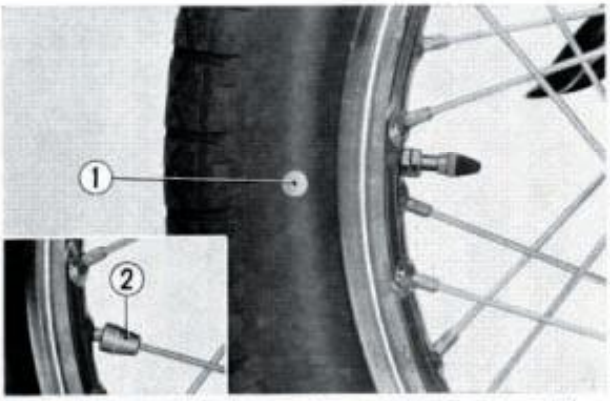

Fig. 206 ① Balance marking ② Balance weight

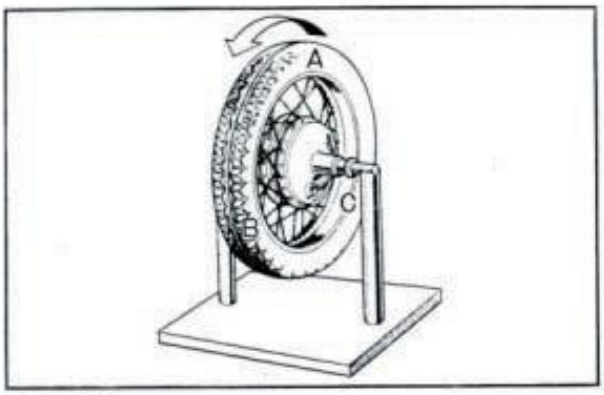

Fig. 207

5. Install the speedometer gear box on the opposite side of the brake disc, and insert front axle into the hub through the speedometer gear box.
6. Mount the front wheel on the front fork, install the axle holders, and tighten the nuts.

Note:
Make sure that the speedometer gear box is mounted in the proper position.
First tighten the axle holder on the left side (brake disc side), and then the right side.

7. Connect the speedometer cable to the gear box.
8. Checking the wheel balance
   a. Mark the side of the tire and rotate the wheel lightly several times and observe the position where the mark comes to rest.
   b. If the wheel is not statically balanced, the mark on the tire will come to rest at the same position. (heavier section will be at the bottom).
   c. Attach a balance weight on the spoke at the lighter section (at the top).
   d. The wheel is in balance when it does not stop at any definite position after rotating the wheel several times.
   The balance weights are available in four different weight sizes (5, 10, 15 and 20 gr).
   e. The front wheel should be balanced with the brake disc installed.

Front disc brake

The disc brake system consists of the brake lever and master cylinder on the right handle bar, caliper mounted on the front fork left side, and the special stainless steel brake disc mounted on the wheel hub.

(Operation)

1. When the brake lever ① is gripped, the cam ② at the base of the lever actuates a piston of the master cylinder.
2. The piston moves the primary cup ③ which blocks the passage to the reservoir and pressurizes the fluid within the master cylinder. This pressure is transmitted to the caliper chamber through brake hose B ④, 3 way joint ⑤, and brake hose A ⑦. Also, the stop light pressure switch ⑥ mounted on the 3 way joint is actuated.
3. The hydraulic pressure within caliper chamber A applies pressure against piston ⑨, which forces pad A ⑩ against the brake disc. Since the caliper assembly is mounted on an arm which pivots at the front fork, it is free to swivel, therefore, the reaction from pad A ⑩ is transmitted to pad B, resulting in equalized pressure being applied by the pads to both sides of the brake disc.

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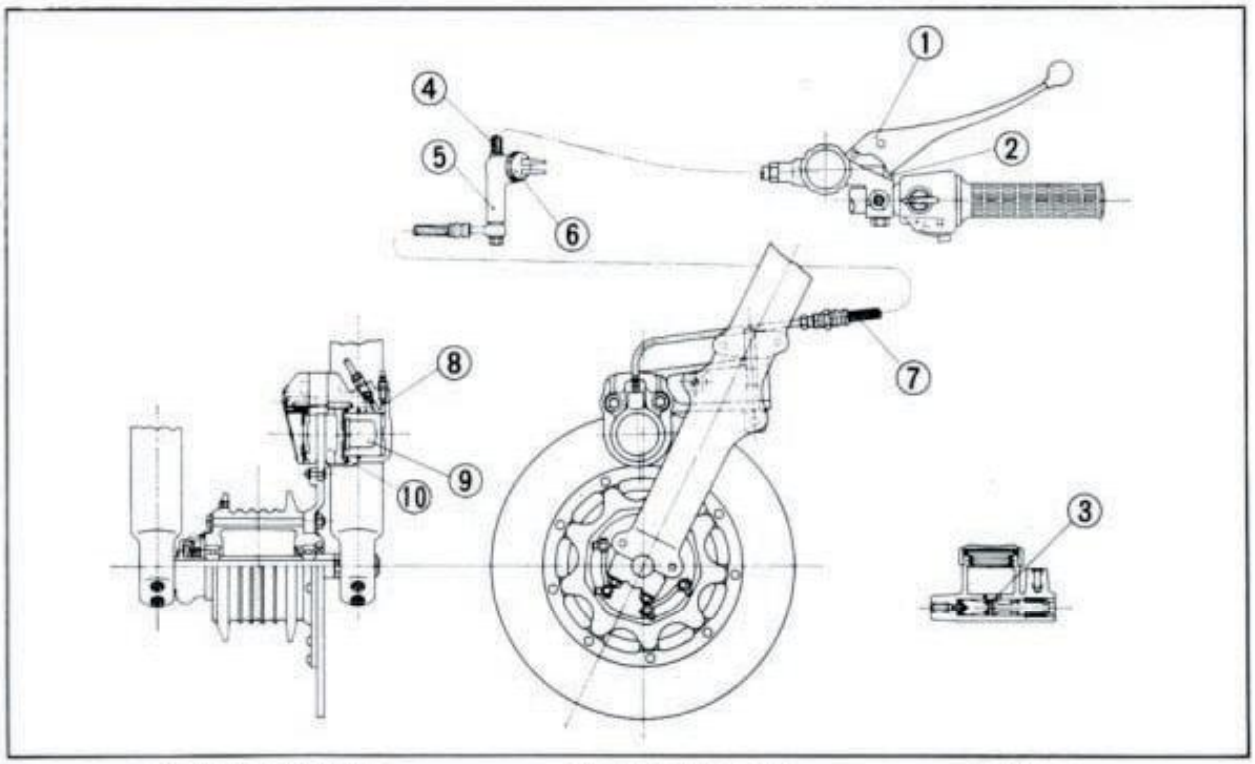


① Front brake lever
② Front brake lever cam
③ Primary cup
④ Front brake hose B
⑤ Three way joint
⑥ Stop switch
⑦ Front brake hose A
⑧ Caliper A
⑨ Piston
⑩ Pad A

Fig. 208

A. Disassembly

1. Remove the front wheel.
2. Unscrew the oil joint bolt and disconnect the brake hose.

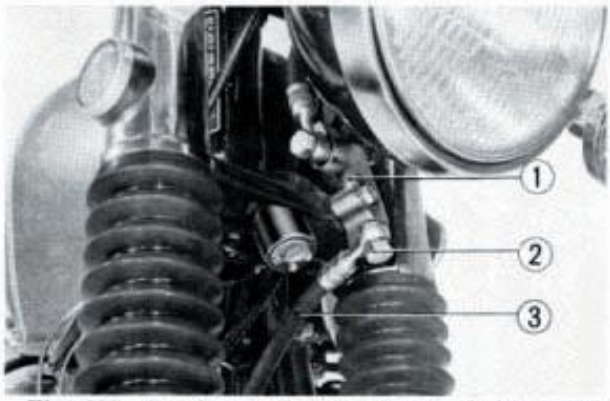


Fig. 209 ① Oil joint ② Oil joint bolt ③ Brake hose

3. Unscrew the three caliper mounting bolts and a caliper adjusting bolt, and remove the caliper assembly.
4. Unscrew the two caliper set bolts and separate caliper A and B.

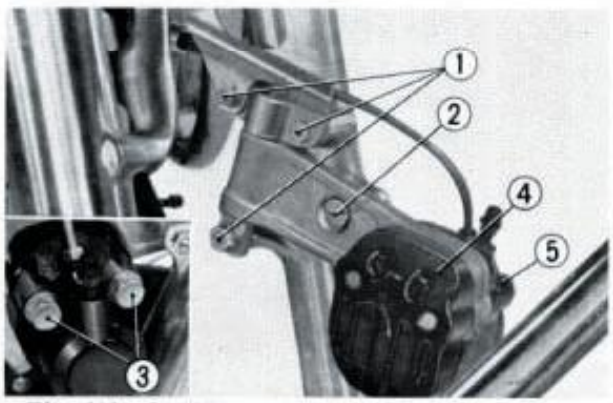


Fig. 210 ① Caliper mounting bolts
② Caliper adjusting bolt
③ Caliper set bolts
④ Caliper B
⑤ Caliper A

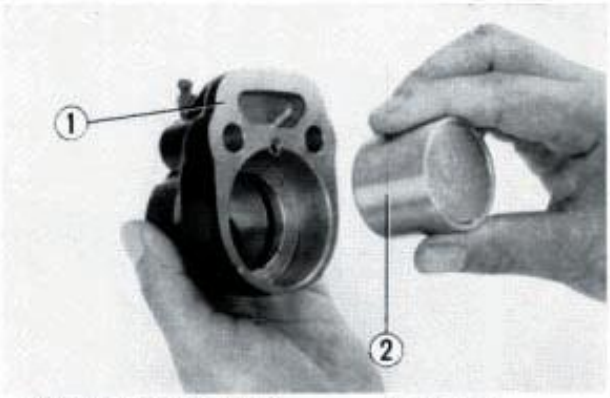


Fig. 211 ① Caliper A ② Piston

5. Remove pad A and piston from caliper A.
6. Remove pad B from caliper B.

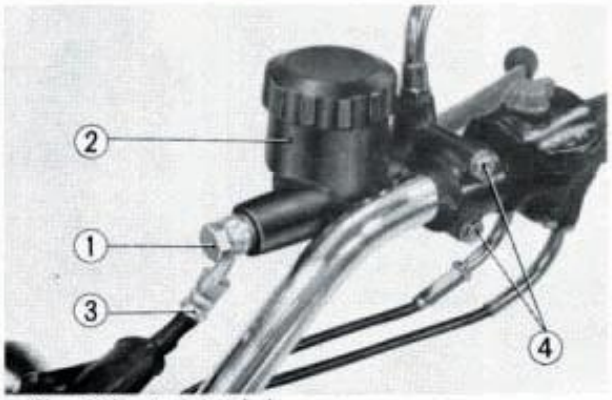
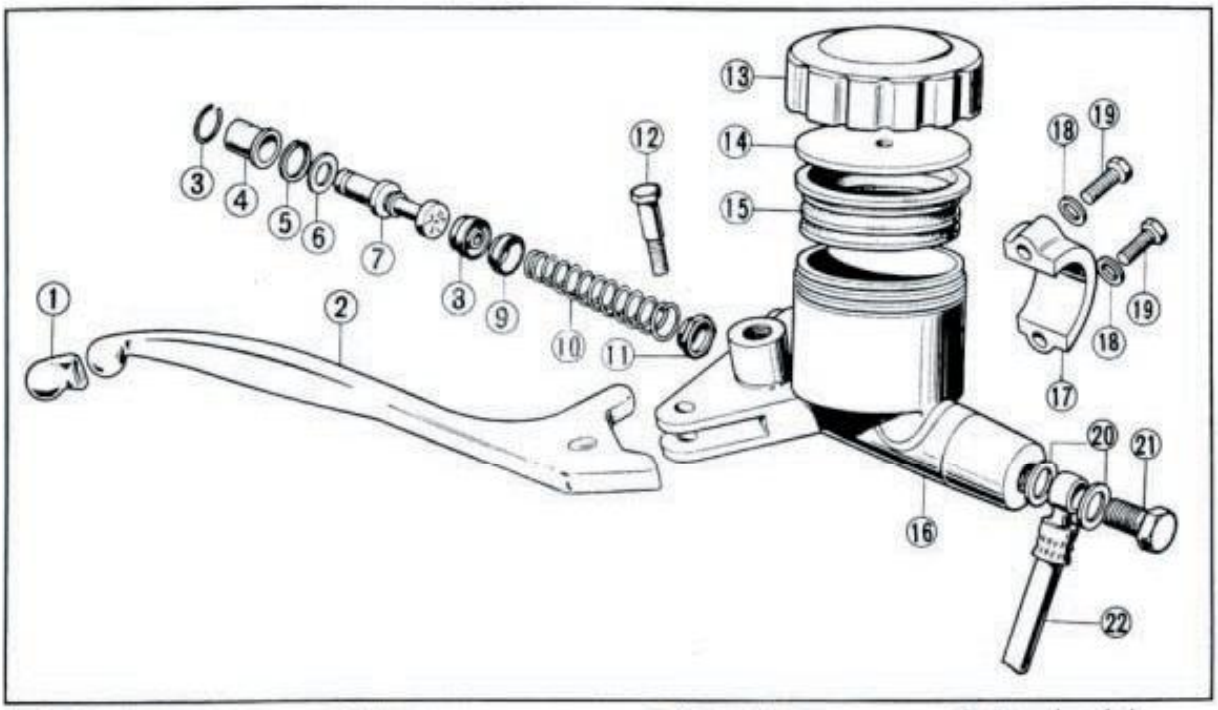


Fig. 212 ① Joint bolt
② Master cylinder unit
③ Brake hose
④ Master cylinder mounting bols

7. Unscrew the master cylinder joint bolt and remove the brake hose.
8. Unscrew the master cylinder mounting bolts and remove the master cylinder unit from the handle bar.
9. Disassemble the master cylinder.



① Brake lever cap
② Brake lever
③ Stopper washer
④ Boot
⑤ 18mm internal snap ring
⑥ 10.5mm washer
⑦ Piston
⑧ Secondary cup
⑨ Primary cup
⑩ Spring
⑪ Check valve
⑫ Handle lever pivot bolt
⑬ Reservoir cap
⑭ Master cylinder plate
⑮ Diaphragm
⑯ Master cylinder body
⑰ Master cylinder holder
⑱ 6mm spring washer
⑲ 6mm hex bolt
⑳ Joint bolt washer
㉑ Joint bolt
㉒ Front brake hose

Fig. 213

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

10. Remove the boot and remove the snap ring from the master cylinder body. Next, remove the 10.5 mm washer, piston, secondary cup, spring, and check valve.

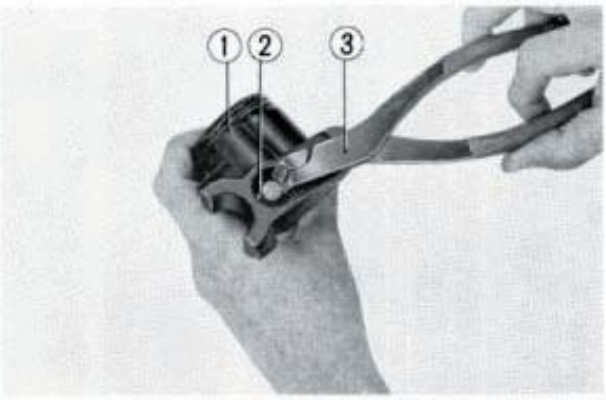


Fig. 214 ① Master cylinder body ③ Special pliers
② Snap ring

B. Inspection

1. Checking the wear of the disc brake pad. Red grooves are provided for both pad A and B as a wear limit indicator. When the pad is worn to this red groove, the pad should be replaced. After replacing the pads, adjust the clearance between the brake disc and pad to **0.15 mm (0.006 in.)** with the caliper adjusting bolt.
   Adjust by turning the caliper adjusting bolt until the pad drags slightly against the brake disc, and from this position back off 1/2 turn and tighten the lock nut.

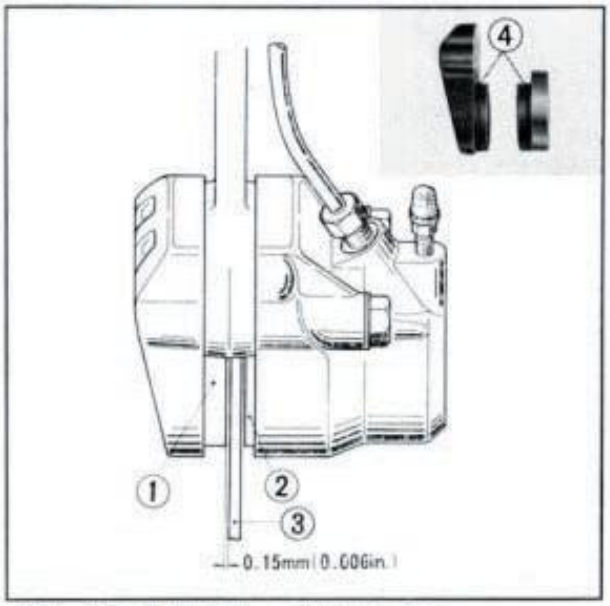


Fig. 215 ① Pad B ③ Brake disc
② Pad A ④ Wear limit indicator

2. Checking the caliper cylinder and piston. Measure the inside diameter of the caliper cylinder and the outside diameter of the piston using a cylinder gauge and a micrometer. If the clearance is greater than serviceable limit, replace the part.

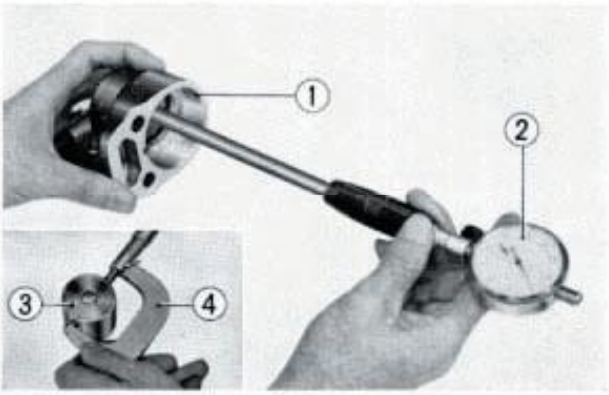


Fig. 216 ① Caliper cylinder ③ Piston
② Cylinder gauge ④ Micrometer

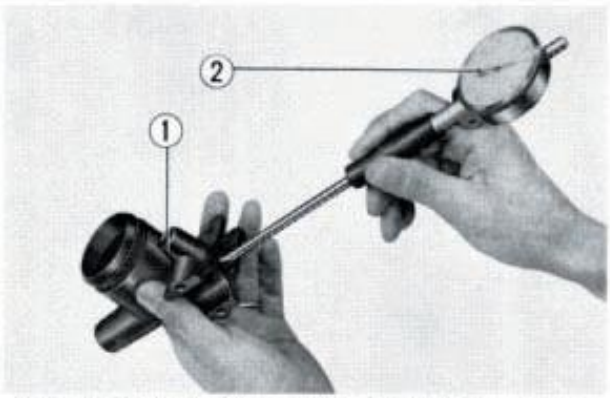


Fig. 217 ① Master cylinder ② Cylinder gauge

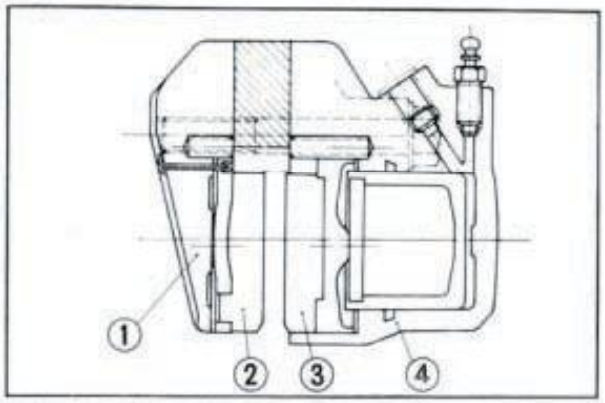


Fig. 218 ① Caliper B ③ Pad A
② Pad B ④ Caliper A

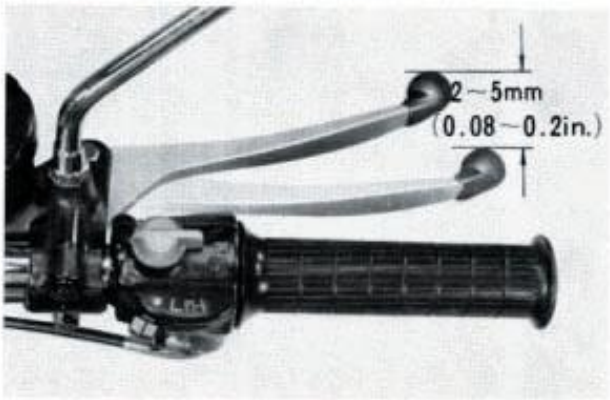


Fig. 219

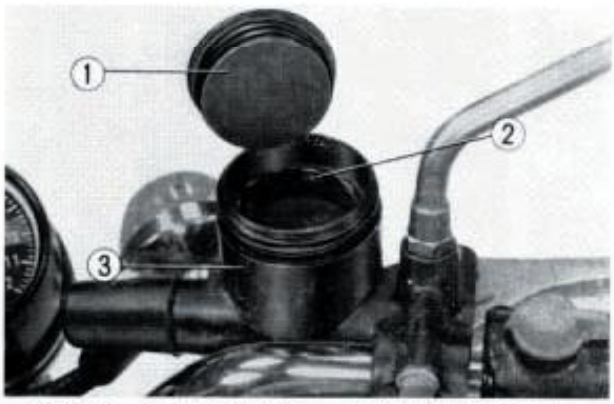


Fig. 220 ① Diaphragm ③ Master cylinder
② Brake fluid

3. Checking the master cylinder and piston. Measure the inside diameter of the cylinder and the outside diameter of the piston using cylinder gauge and a micrometer. If the clearance is greater than serviceable limit, replace the part.

C. Reassembly

1. Perform reassembly in the reverse order of disassembly.
2. Assemble pad A and B.

Note:
Apply silicone sealing grease on the pads sliding surfaces of the caliper before assemblying pad A and B. This serves as a dust preventative as well as water repellent. Do not apply grease on the pad friction surface.

3. Mount the caliper assembly on the front fork.
4. Mount the master cylinder unit on the handle bar.
5. Fill the master cylinder reservoir with **SAE J1703a brake fluid.**

D. Brake adjustment

When the brake has been disassembled always perform the air bleeding operation of the hydraulic brake and then adjust the brake.

1. Brake lever free play
   Lever free play of **2~5 mm (0.08~0.2 in.)** measured at the end of the lever is normal. If the play is excessive, inspect the brake system and replace any worn or defective part.
2. Brake fluid level
   Fill the reservoir with brake fluid to the level line.

Note:
Brake fluid will damage paint finish, rubber parts, and meter components, therefore, exercise care in handling and immediately wipe in case of spillage.

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3. Air bleeding the brake system
When air enters the brake hydraulic system, braking effectiveness degrades and creates a hazardous condition. If brake lever action becomes soft or spongy, or if the fluid reservoir is allowed to become dry, perform the bleeding in the following manner.
   a. Fill the reservoir with brake fluid up to the level line.
   b. Install the diaphragm to prevent loss of brake fluid.
   c. Attach a bleeder tube to the bleeder screw and place the opposite end into a vessel to catch the fluid.
   d. Pump the brake lever several times, and open the bleeder screw a half turn while maintaining a grip on the brake lever. When the lever bottoms, first, close the bleeder screw before releasing the lever. Repeat this operation several times until there are no air bubbles in the fluid which flows out of the bleeder tube.

Note:
Replenish the fluid in the reservoir and do not allow the reservoir to become dry as it will permit air to enter the brake hydraulic system.

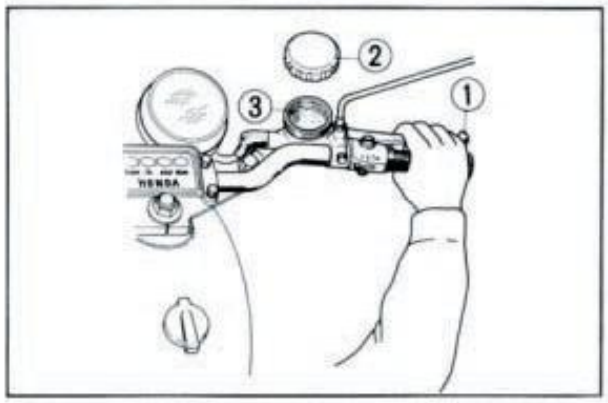

Fig. 221 ① Front brake lever ② Reservoir cap ③ Diaphragm

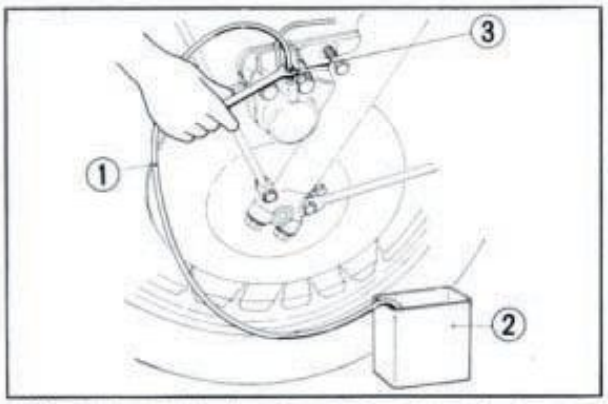

Fig. 222 ① Bleeder tube ② Vessel ③ Bleeder screw

2. REAR WHEEL AND REAR BRAKE

① 6304 U ball bearing
② Distance collar
③ Wheel balancer
④ Tire
⑤ Tube
⑥ Tire flap
⑦ Wheel hub
⑧ Rim
⑨ O-ring
⑩ Wheel damper A
⑪ Wheel damper B
⑫ Final driven flange
⑬ Distance collar B
⑭ 6305 U ball bearing
⑮ Bearing retainer
⑯ 10×48 driven sprocket bolt
⑰ Side collar
⑱ Final driven sprocket
⑲ 34559 oil seal
⑳ O-ring
㉑ Sprocket side plate
㉒ Tongued washer
㉓ 10 mm nut

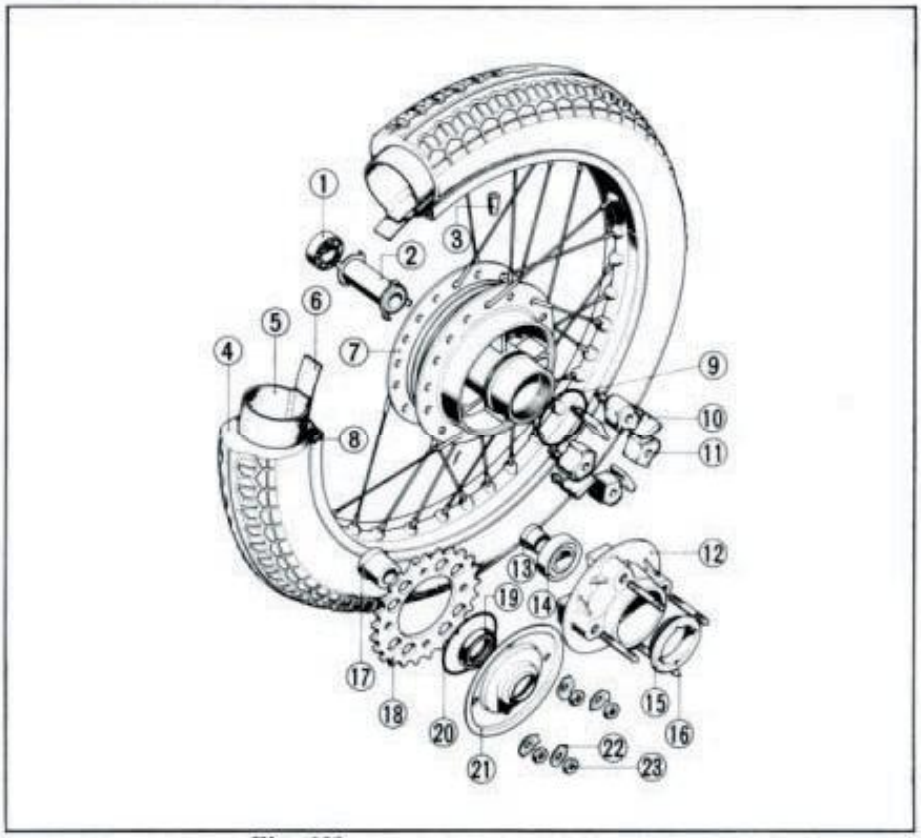

Fig. 223

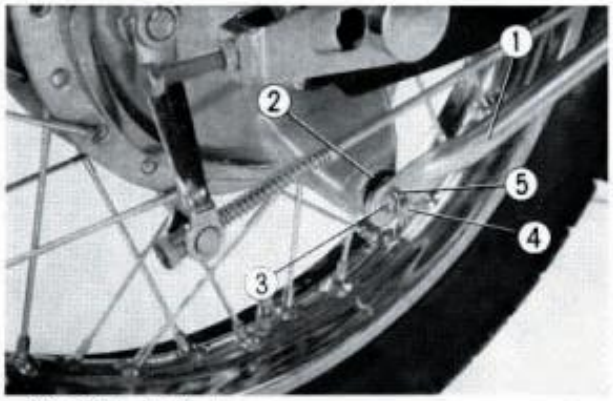

Fig. 224 ① Brake stopper arm
② Stopper arm cushion rubber
③ 8mm nut
④ Panel stopper bolt
⑤ Lock pin

A. Disassembly

1. Remove the rear brake rod.
2. Remove the rear brake panel stopper bolt to disconnect the brake stopper arm.

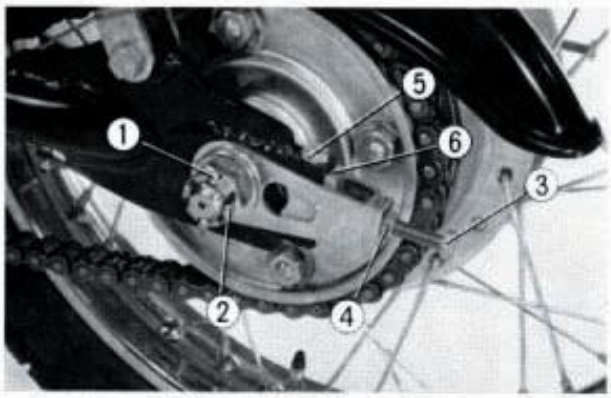

Fig. 225 ① Cotter pin
② Axle nut
③ Adjusting bolt
④ Lock nut
⑤ Lock bolt
⑥ Chain adjusting stopper

3. Remove the both left and right mufflers.
4. Loosen the drive chain adjusting bolt on both sides, remove the cotter pin, and loosen the axle nut.
5. Push the wheel forward, and lift the chain off the driven sprocket. Remove the lock bolts, chain adjusting stoppers and pull the wheel rearward to remove the wheel and axle from the rear wheel.
6. Straighten the tongued washers and unscrew the four nuts to remove the driven sprocket.
7. Remove the rear wheel bearing retainer with the bearing retainer remover, and drive out the bearing from the hub.

Note:
The bearing retainer has a left hand thread.

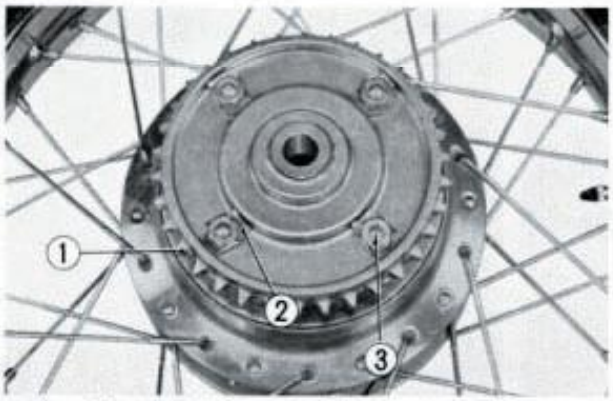

Fig. 226 ① Driven sprocket
② Tongued washer
③ Lock nut

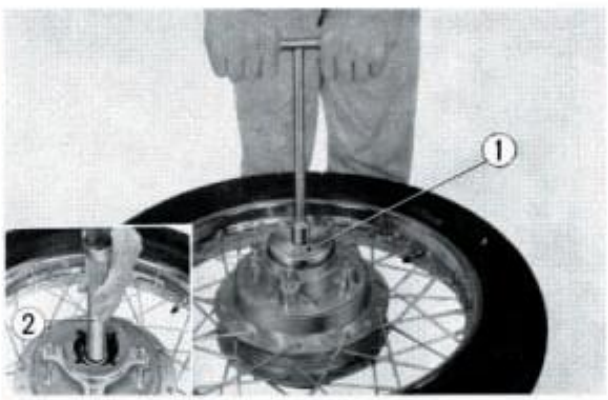

Fig. 227 ① Bearing retainer remover
② Bearing driver

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

8. Remove the two cotter pins and washer from the brake shoe anchor posts.

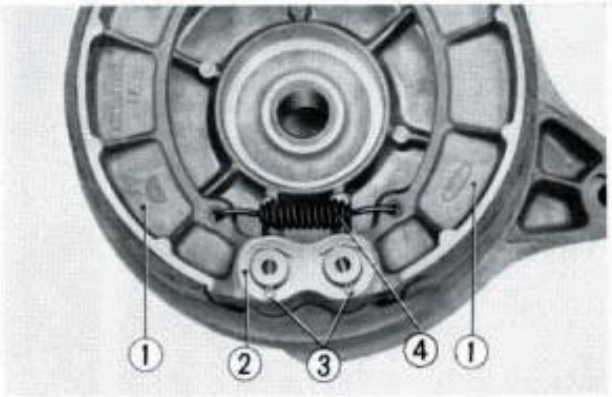

Fig. 228 ① Brake shoes ③ Cotter pins ② Pin washer ④ Brake shoe spring

B. Inspection

1. Check rim runout and wobble.
2. Check rear axle shaft runout.
3. Check brake lining wear.
4. Check brake drum wear.
5. Check ball bearing wear.
6. Check for loose spokes, bending and damage. Tighten, straighten or replace as necessary.
7. Check tire on both inside and outside for cuts, bruises, and imbedded of nails. Repair or replace as necessary.

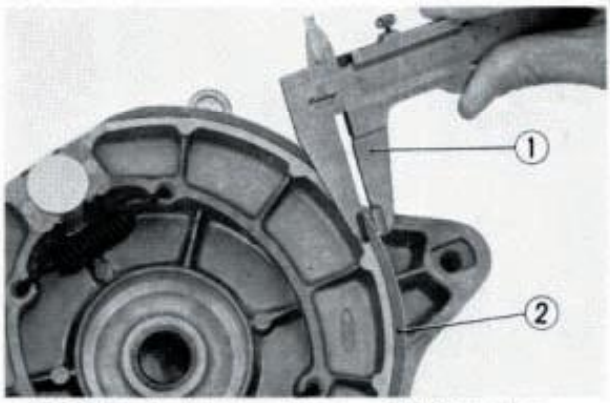

Fig. 229 ① Vernier caliper ② Brake shoe

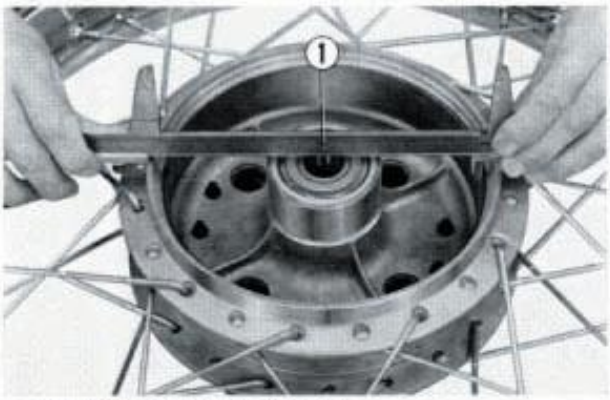

Fig. 230 ① Vernier caliper

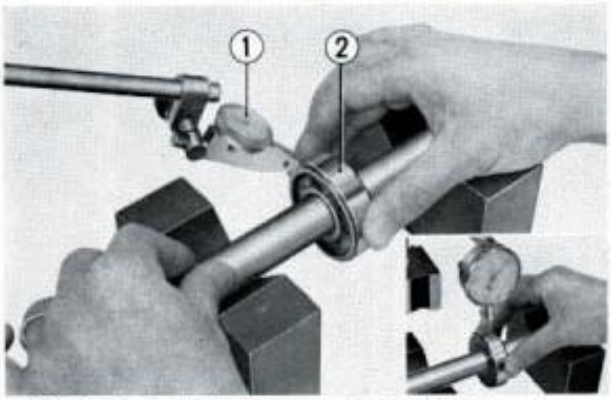

Fig. 231 ① Dial gauge ② Ball bearing

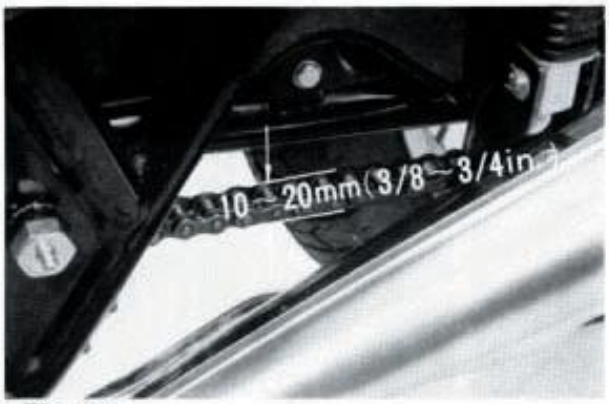

Fig. 232

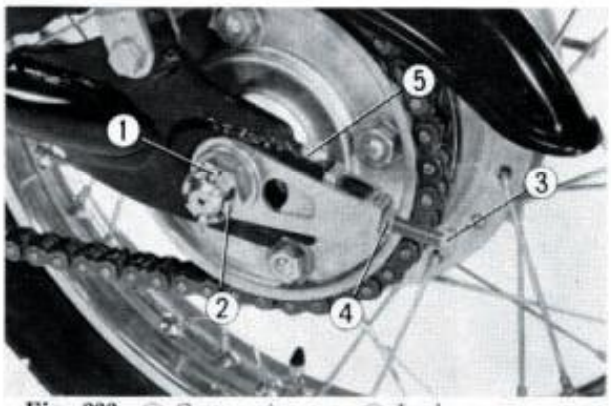

Fig. 233 ① Cotter pin ④ Lock nut
② Axle nut ⑤ Lock bolt
③ Adjusting bolt

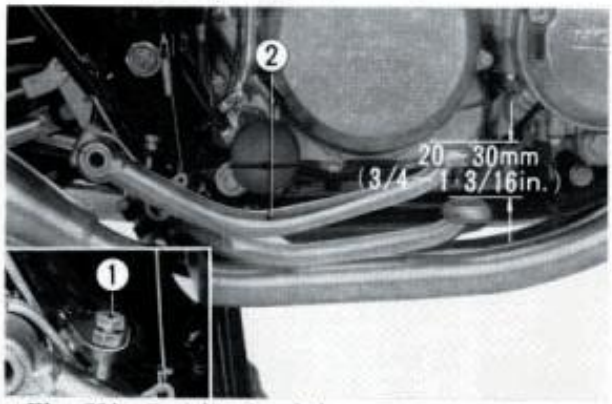

Fig. 234 ① Adjusting bolt
② Brake pedal

Fig. 235 ① Adjusting nut

C. Reassembly

1. Perform reassembly in the reverse order of disassembly.
2. Install the brake shoes on the brake panel.

Note:

Use thread lock cement when installing the bearing retainer.

Apply grease on the friction surfaces of the flange and wheel hub.

3. Mount the brake panel on the hub and the drive chain on the sprocket. Insert the wheel axle through the assembled wheel hub, and mount the wheel on the rear fork.
4. After completing the reassembly, adjust the slack of the drive chain.
   a. Normal chain slack is 10~20 mm (3/8~3/4 in) with a slight force.
   b. Loosen the axle nut and adjust the drive chain with the adjusting bolt, making sure the adjuster marks on both sides are in the same position when completed.
5. Install the rear brake stopper arm, and adjust the height and play of the brake pedal.
   a. Adjust the height of the pedal with the adjusting bolt.
   b. Adjust the free play of the pedal to 20~30 mm ($^3/_4$~$1\ ^3/_{16}$ in) with the adjusting nut on the end of the brake rod.

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

3. STEERING

The steel tube handle bar is mounted on the front fork top bridge with the handle bar holders. The top bridge is bolted to the front fork and steering stem. The steering stem is mounted on the frame head pipe.

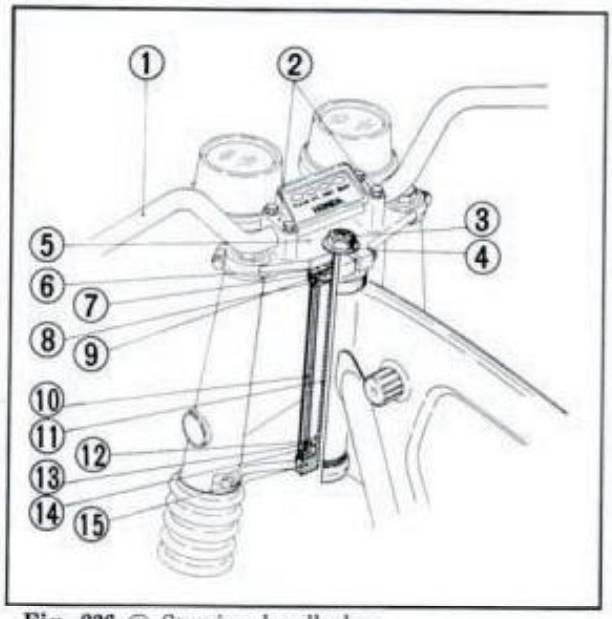

Fig. 236 ① Steering handle bar
② Handle bar holder
③ Steering stem nut
④ Steering stem washer
⑤ Fork top bridge
⑥ Steering head top nut
⑦ Steering head top cone race
⑧ Steel ball
⑨ Steering top ball race
⑩ Steering head
⑪ Steering stem
⑫ Steering bottom ball race
⑬ Steel ball
⑭ Steering bottom cone race
⑮ Steering head dust seal

A. Disassembly

1. Unscrew two bolts to remove the master cylinder unit.
2. Disconnect the clutch cable at the clutch lever.
3. Remove the lighting switch and disconnect the throttle cable from the throttle grip pipe.
4. Remove the head light unit from the head light case and disconnect the wiring at the harness within the case.
5. Unscrew four bolts, remove the handle bar holders and disconnect the wire harness.

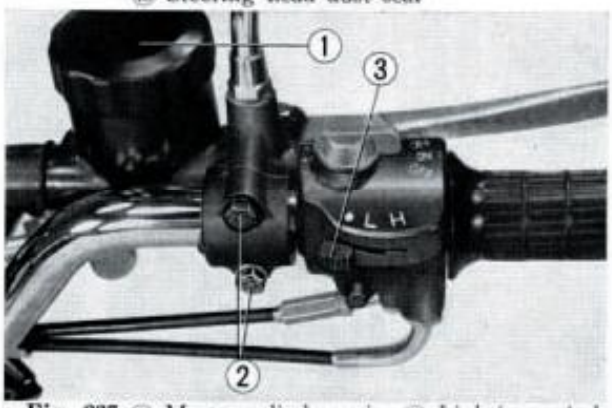

Fig. 237 ① Master cylinder unit ③ Lighting switch
② 6 mm bolts

Fig. 238 ① Upper handle bar holders ② Handle bar

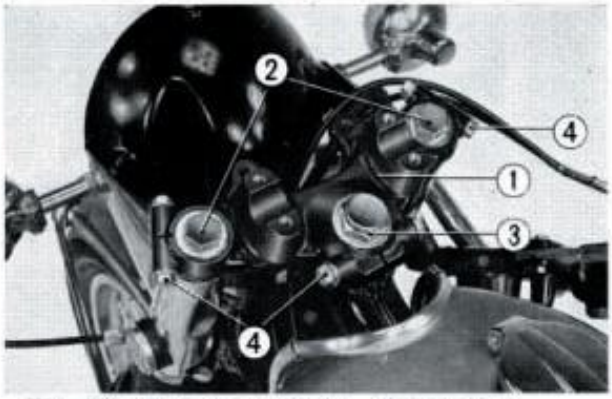

Fig. 239 ① Fork top bridge ③ Stem nut
② Fork top bolts ④ 8 mm bolts

6. Unscrew the two mounting bolts and remove the speedometer and tachometer.
7. Unscrew the stem nut, remove the 8 mm bolts and the fork top bridge.

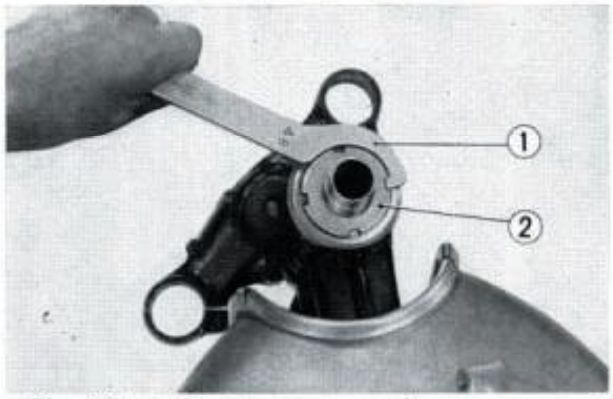

Fig. 240 ① Steering stem wrench
② Steering stem head nut

8. Remove the front fork.
9. Unscrew the steering stem head nut with the stem wrench.
10. Remove the steering stem out the bottom.

Note:
Steel balls will drop out, therefore, exercise care not to loose them.

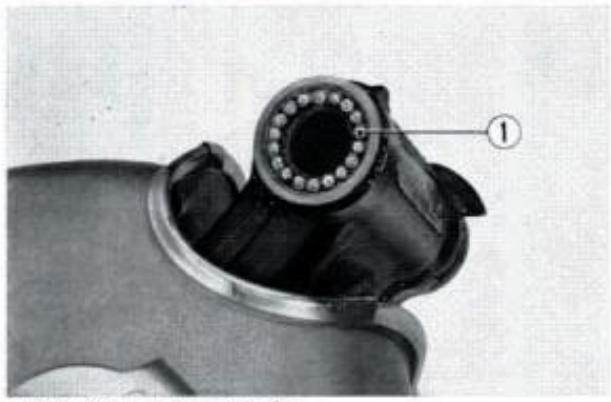

Fig. 241 ① Steel balls

B. Inspection

1. Check the handle bar for twisting and damage.
2. Check the steering stem for twisting and cracking.
3. Check the steel balls for cracks and wear.
4. Check the cone race for wear.

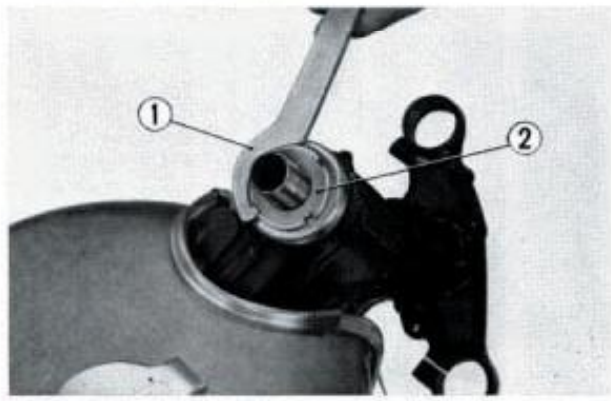

Fig. 242 ① Steering stem wrench
② Steering stem head nut

C. Reassembly

1. Mix the steel balls in grease and assemble 18 into the upper race and 19 into the lower cone.
2. Install the steering stem into the head pipe being careful not to drop the steel balls.
3. Assemble the top cone race and tighten the steering stem head nut.

Note:
Before assembly, wash the cone and ball races, and steel balls. Mix the balls in new grease.

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

4. Assemble the front fork.
5. Assemble the front fork top bridge, and mount the speedometer and tachometer.
6. Install the handle bar.

Note:

Align the punch marks on the handle bar to the parting surface of the holder.

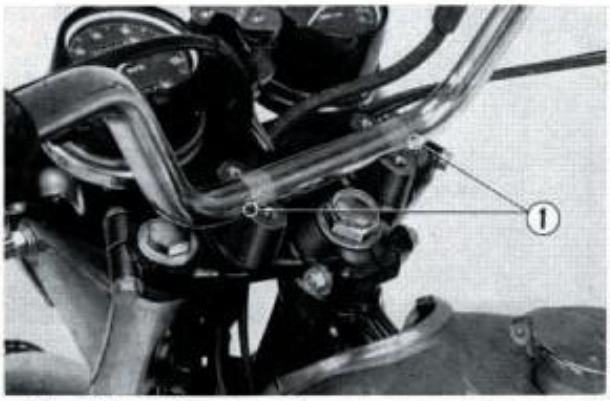

Fig. 243 ① Punch marks

7. Reconnect the electrical wiring.
8. Reconnect the clutch and throttle cables, and the brake hose to the master cylinder unit.

Note:

- **Make sure the cables and the electrical wirings are free from binding when the handle is turned fully to both sides.**
- **Adjust the play in the cables.**
  Clutch lever: 10.0~20.0 mm (3/8~3/4 in.) at the end of the lever.
  Brake lever: 2~5 mm (5/64~13/64 in.) at the end of the lever.

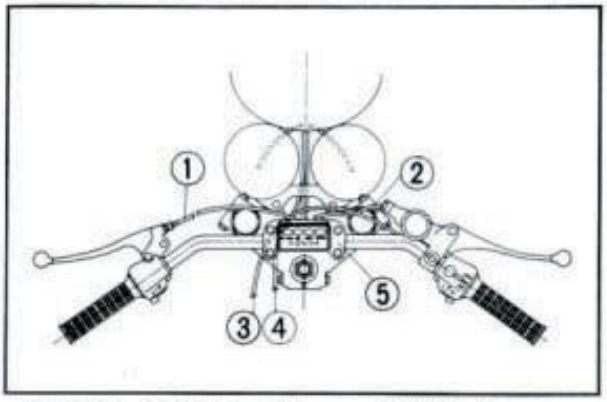

Fig. 244 ① Clutch cable ④ Wire harness
② Front brake hose ⑤ Fork top bridge
③ Throttle cable

4. FRONT SUSPENSION

The front fork unit consist of a lightweight aluminium front fork bottom case with a dual action telescoping shock absorber oil damper. Cushioning travel is 91 mm (3.15 in.) on compression and 31 mm (1.22 in.) on extension strokes.

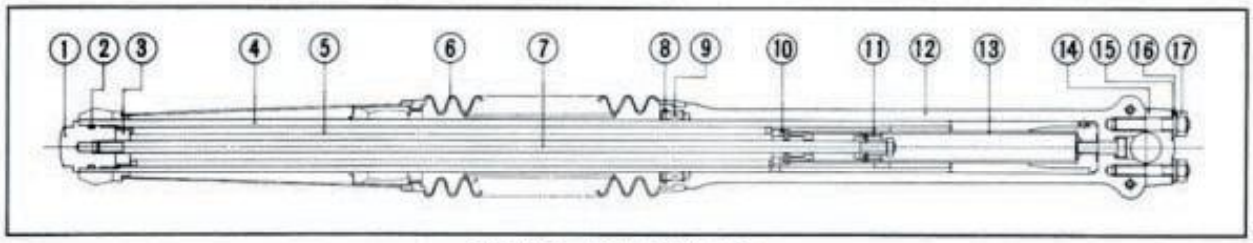

Fig. 245 Front fork unit

① Front fork bolt
② O-ring
③ Lock nut
④ Front fork pipe
⑤ Front suspension spring
⑥ Front fork boot
⑦ Damper rod
⑧ Snap ring
⑨ Oil seal
⑩ Holder
⑪ Collar
⑫ Front fork bottom case
⑬ Damper case
⑭ Axle holder
⑮ Plain washer
⑯ Spring washer
⑰ Nut

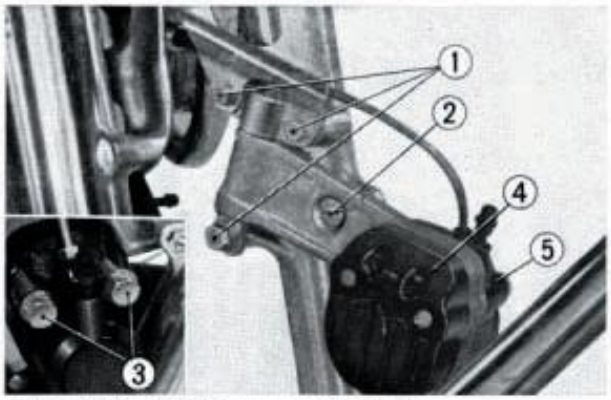

Fig. 246 ① Caliper mounting bolts
② Adjusting screw
③ Caliper set bolts
④ Caliper B
⑤ Caliper A

A. Disassembly

1. Loosen the fork bolt, remove the drain plug and drain the damper oil.
2. Remove the front wheel.
3. Unscrew the three caliper mounting bolts and an adjusting screw, and remove the caliper from the left front fork.

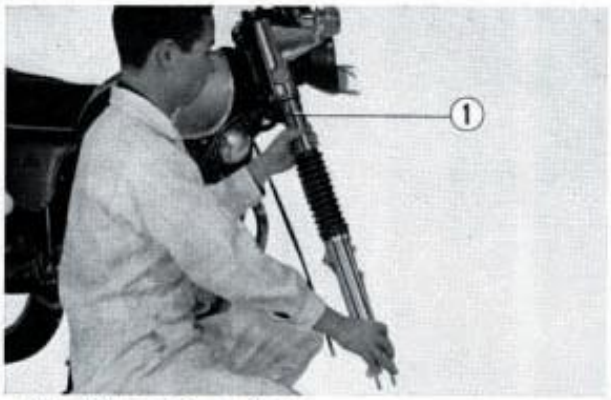

Fig. 247 ① Front fork

4. Unscrew the 8×56 mm and the 10×35 mm bolts, and pull the forks off the bottom.

5. Unscrew the front fork bolt, loose from the piston rod lock nut, and remove the front fork spring and cushion spring seat.
   Separate the front fork pipe and bottom case.

6. Unscrew the 8 mm bottom case bolt using a special tool and remove the damper unit from the bottom case.

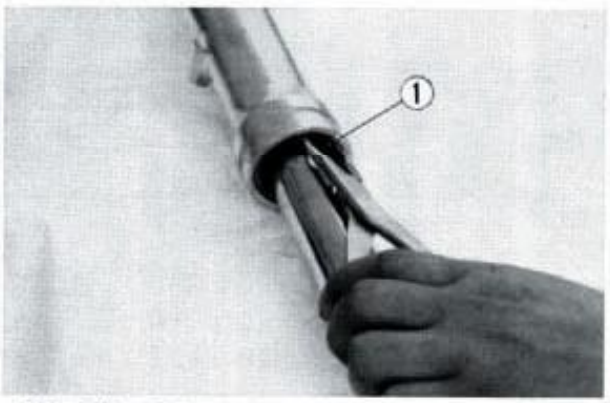

Fig. 248 ① Snap ring

Fig. 249 ① Front fork bolt
② Lock nut
③ Cushion spring seat
④ Snap ring
⑤ Oil seal
⑥ Bottom case
⑦ 8 mm bolt
⑧ Damper unit
⑨ Fork spring
⑩ Fork pipe
⑪ Special tool

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

B. Inspection

1. Check the front suspension spring.
2. Check the fork pipe and bottom case for damage or looseness.
3. Check the oil seal for scratches and damage.
4. Check for excessive clearance between the shock absorber piston and the cylinder.

C. Reassembly

1. Reassemble in the reverse order of disassembly.
2. Assemble the damper unit and cushion spring with the lock nut, and install the unit into the bottom case.
3. Install the front fork pipe.
4. Install the snap ring.
5. Apply thread lock cement around the thread of the piston rod, and tighten the lock nut. Next, tighten the fork bolt on the piston rod and screw the fork bolt into the fork pipe.
6. Install the front fork unit through the steering stem and mount it with the 8 mm and 10 mm bolt.

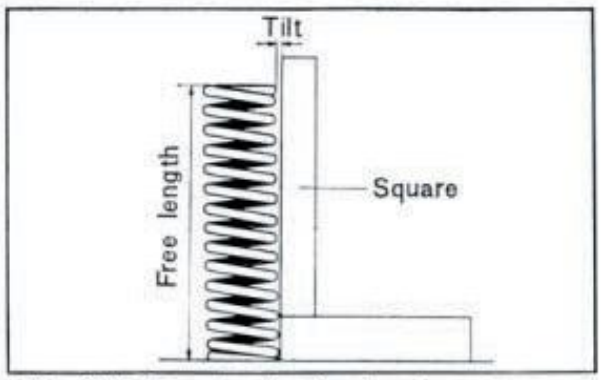

Fig. 250 Measuring the free length

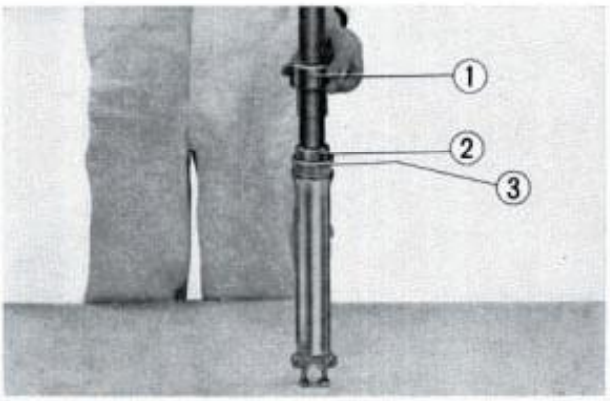

Fig. 251 ① Oil seal drive weight ② Oil seal drive guide ③ Oil seal

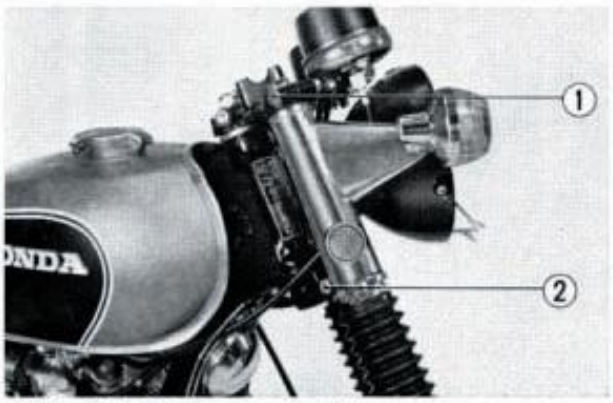

Fig. 252 ① 8 mm setting bolt ② 10 mm setting bolt

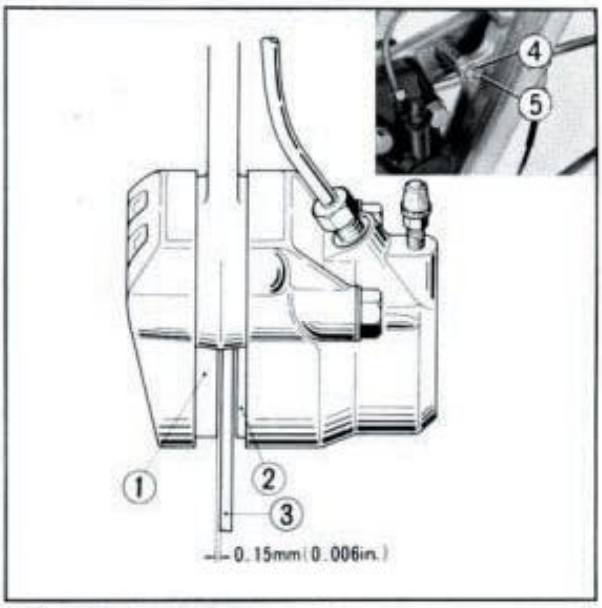

Fig. 253 ① Pad B ② Pad A ③ Brake disc ④ Nut ⑤ Caliper adjusting screw

7. Fill the fork bottom case with 160 cc (5.4 ozs) SAE 10 W-30 grade oil through the fork top bolt hole.
8. Adjust the front brake caliper.
   Adjust the clearance between brake disc and pad B to **0.15 mm (0.006 in.)** with the caliper adjusting screw.

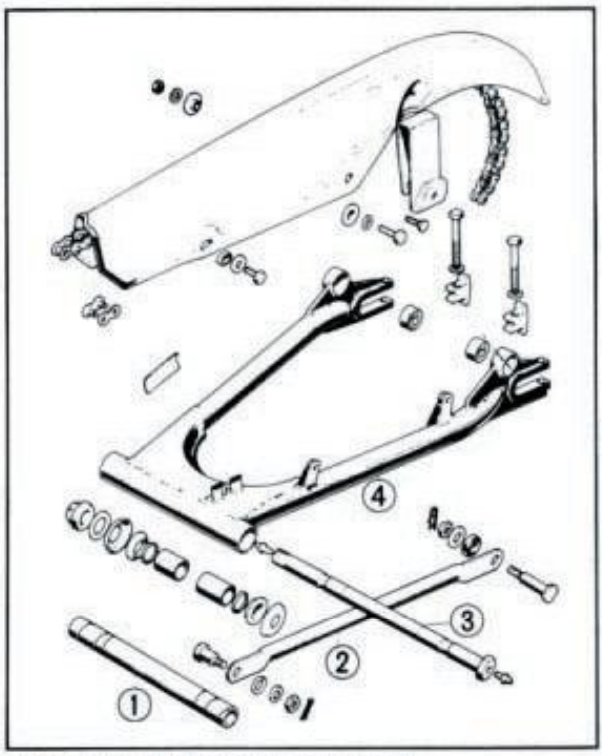

Fig. 254 ① Rear fork pivot collar
② Torque link arm
③ Rear fork pivot shaft
④ Rear fork

5. REAR SUSPENSION

The rear suspension is equipped with dual action telescoping shock absorbers.
Rear fork is a swing arm type of tubular construction which provides greater rigidity.

A. Disassembly

1. Remove the mufflers.
2. Remove the rear wheel.
3. Remove the rear suspension mounting nut and bolt, and then remove the suspension from the frame and rear fork.
4. Compress the rear suspension spring using a special suspension compressor tool, and disassemble.

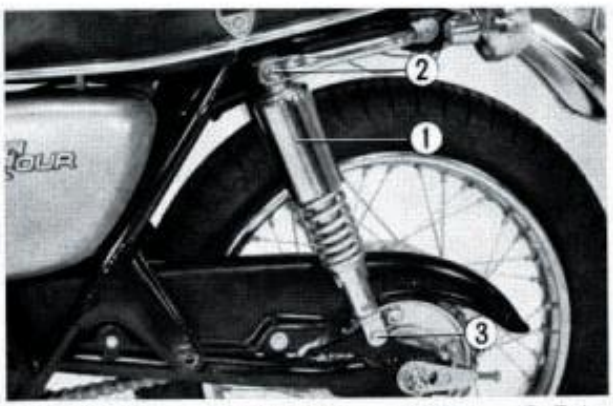

Fig. 255 ① Rear suspension ② Nut ③ Bolt

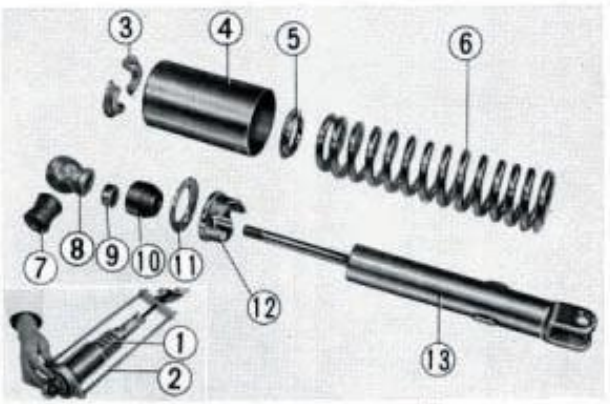

Fig. 256 ① Rear suspension assembly
② Suspension compressor tool
③ Spring seat stopper
④ Rear suspension upper cover
⑤ Spring seat
⑥ Rear suspension spring
⑦ Joint rubber
⑧ Joint
⑨ Nut
⑩ Rubber
⑪ Spring seat
⑫ Spring adjuster
⑬ Rear damper

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

5. Remove the rear fork pivot nut and shaft, and separate the fork from the frame.

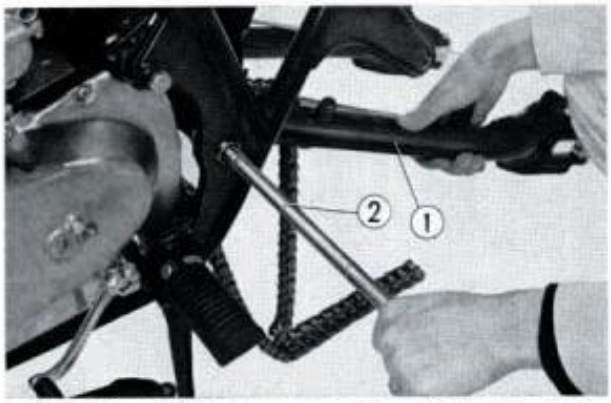

Fig. 257 ① Rear fork ② Rear fork pivot shaft

B. Inspection

1. Check the rear suspension spring.
2. Check damper for oil leaks.
3. Inspect the damper upper case and rod for dent and bend. Make sure the oil damper operates smoothly in both directions.
4. Inspect the damper case and stopper for damage and dent.
5. Check the clearance between the rear fork pivot bushing and shaft.
6. Check the pivot shaft for bending.
7. Check the rear fork swing arm for bend -ing, twisting, and cracks.

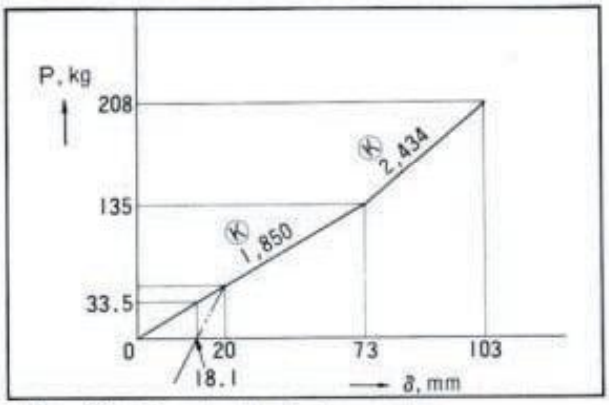

Fig. 258 Rear shock absorber spring characteristic

C. Reassembly

1. Mount the rear brake arm stopper to the rear fork.
2. Apply grease on the fork pivot bushing and install the rear fork on the frame with the pivot shaft.
3. Mount the rear suspension between the frame and fork on both sides and tighten the cap nuts and bolts.
4. Mount the rear wheel.

Note:
When the reassembly is completed, adjust the rear brake and the drive chain tension.

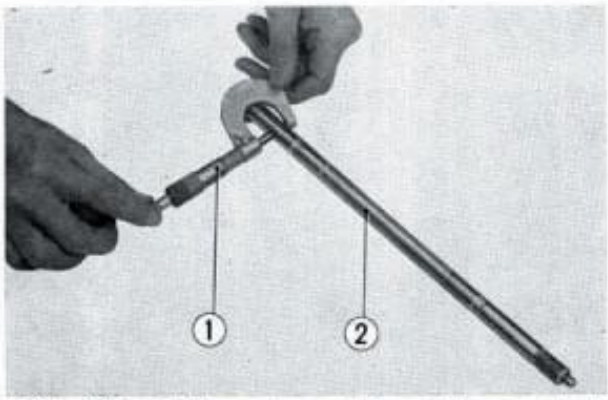

Fig. 259 ① Micrometer ② Rear fork pivot shaft

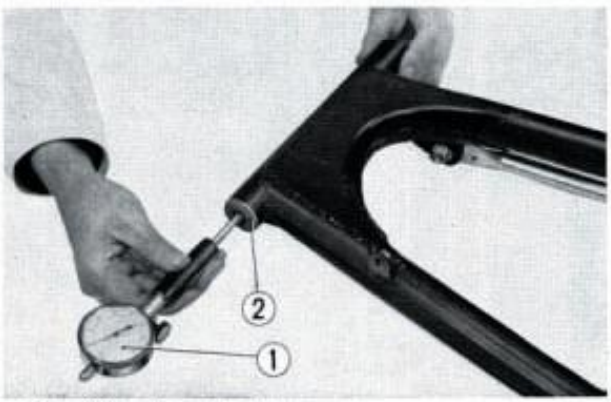

Fig. 260 ① Inside dial gauge
② Rear fork bushing

Fig. 261 ① Fuel tank

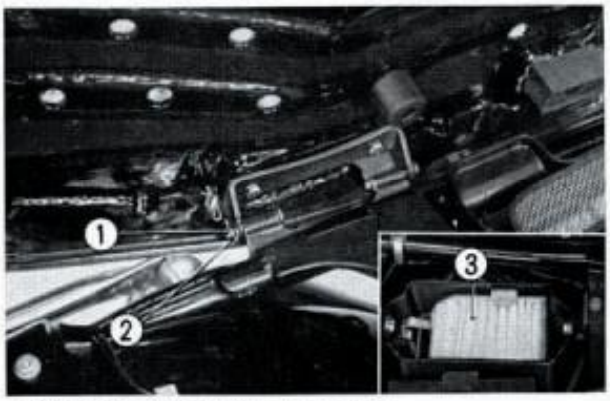

Fig. 262 ① Seat mounting bolt
② Cotter pin
③ Air cleaner

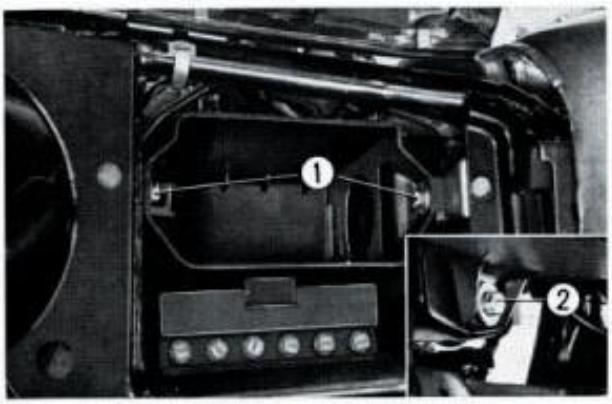

Fig. 263 ① 6 mm bolt ② 6 mm bolt

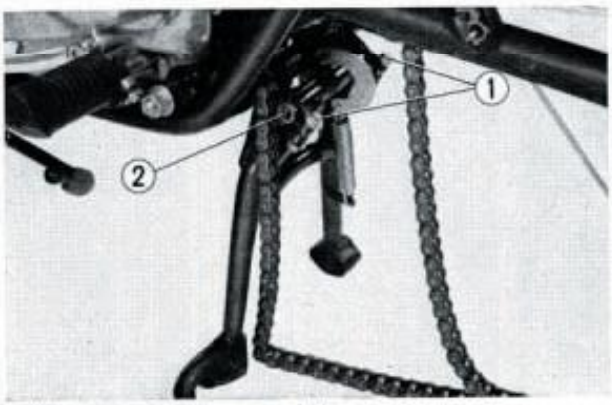

Fig. 264 ① Mounting bolt
② Cotter pin

6. FRAME BODY

A. Construction

The double cradle frame is constructed of steel tubes and plates. The head pipe section is of drawn tubing construction which provides high rigidity and strength for good handling at high riding speed.

B. Disassembly

1. Position the fuel cock lever to 'STOP', disconnect the fuel tube from the fuel cock, and dismount the fuel tank from the frame.
2. Remove the mufflers, and dismount the engine.
3. Remove the front wheel, and the front fork.
4. Remove the handle bar and the steering stem from the frame.
5. Remove the rear wheel, rear fork, and rear fender.
6. Remove the seat, the tool tray, and the air cleaner element.
7. Detach the electrical equipment.
8. To remove the main stand, unscrew the two mounting bolts, remove the cotter pin, and extract the main stand pivot pipe.

Courtesy of Honda4Fun
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9. Remove the top and bottom ball races from the steering head pipe.

Note:
Use a wooden drift to prevent damage when driving out the ball races.

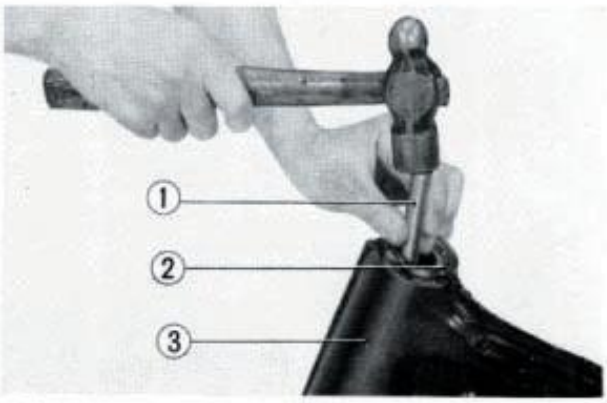

Fig. 265 ① Wooden drift
② Ball race
③ Head pipe

C. Inspection

1. Check the frame main unit for twisting, deformation, and cracks around the welded areas, and the pipes for bending and cracks.
2. Inspect the top and bottom races for scoring and wear.
3. Check the head pipe for misalignment.
4. Check seat cover for tears.
5. Check fuel tank for leaks, fuel tubes for aging or damage, and fuel cock gasket and strainer cup O-ring for damage. Flush the tank interior with clean gosoline.
6. Remove dust from the air cleaner element by blowing compressed air from the inside. Check element for damage.
7. Replace exhaust pipe gasket if damaged.

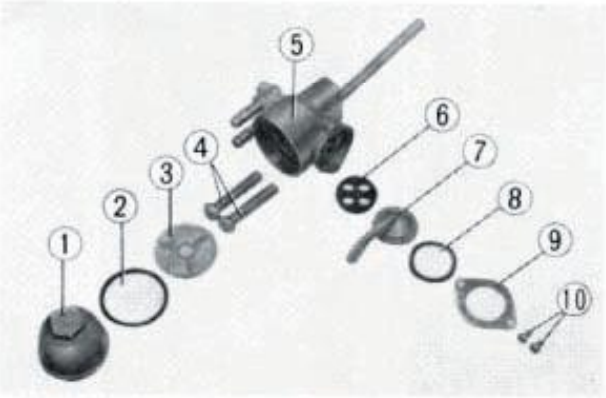

Fig. 266 ① Fuel strainer cup
② O-ring
③ Fuel strainer screen
④ 6 mm cross screws
⑤ Fuel cock body
⑥ Fuel cock gasket
⑦ Fuel cock lever
⑧ Cock lever spring
⑨ Setting plate
⑩ 6 mm screw

D. Reassembly

1. Install the main stand on the frame.
2. Install the rear fender and the electrical equipments on the frame.
3. Install the rear fork, rear cushion and rear wheel.
4. Install the steering stem, front fork and front wheel.
5. Mount the air cleaner case, the battery, the seat, and the fuel tank.

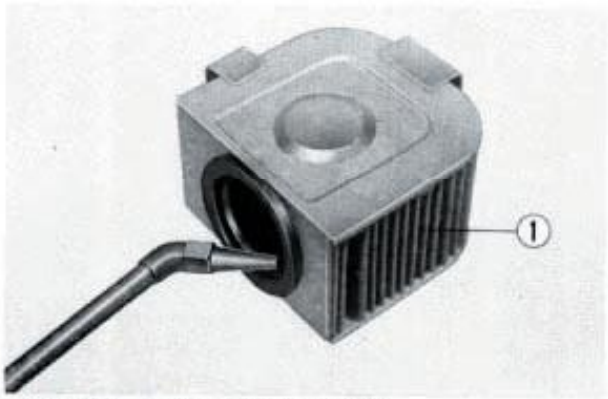

Fig. 267 ① Air cleaner element

6. ELECTRICAL

Courtesy of Honda4Fun
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1. GENERAL DESCRIPTION

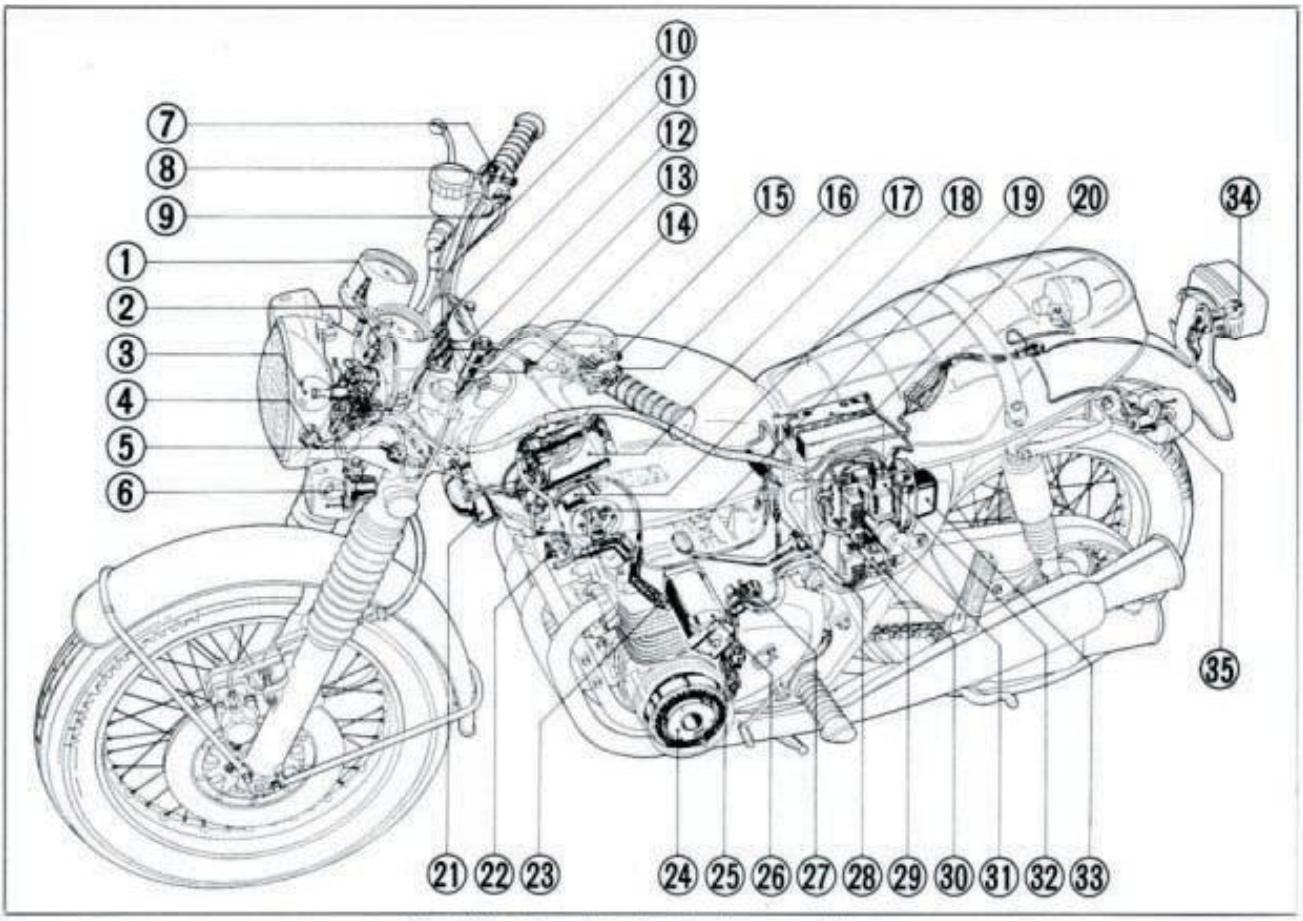

Fig. 268 Complete electrical system diagram

① Tachometer pilot lamp
② Speedometer pilot lamp
③ Head light
④ Position lamp (except USA type)
⑤ Front brake stop switch
⑥ Front winker lamp
⑦ Emergency switch
⑧ Head light switch
⑨ Starter switch
⑩ High beam pilot lamp
⑪ Neutral lamp
⑫ Oil warning lamp
⑬ Winker pilot lamp
⑭ Speed warning lamp (except USA type)
⑮ Winker switch
⑯ Horn button
⑰ Ignition coil
⑱ Speed warning system (except USA type)
⑲ Contact breaker assembly
⑳ Battery
㉑ Horn
㉒ Main switch
㉓ Spark plug
㉔ AC generator
㉕ Oil pressure switch
㉖ Starting motor
㉗ Neutral switch
㉘ Rear brake stop switch
㉙ Fuse holder
㉚ Silicon rectifier
㉛ Winker relay
㉜ Magnetic switch
㉝ Voltage regulator
㉞ Tail/stop lamp
㉟ Rear winker lamp

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2. IGNITION SYSTEM

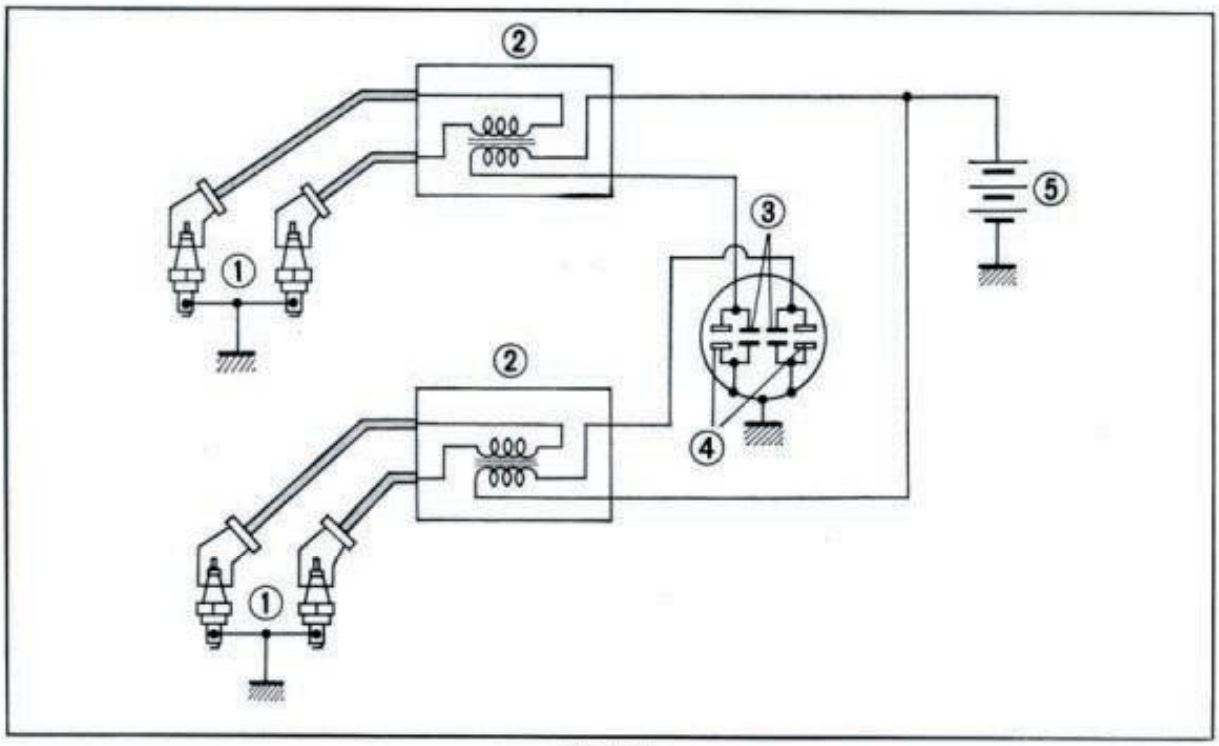

Fig. 269

① Spark plugs
② Ignition coils
③ Condensers
④ Contact breaker
⑤ Battery

The ignition system consists of two ignition coils, two contact breakers, four spark plugs, an ignition switch and a battery.

The current from the battery flows through the primary winding of the ignition coil, and circuit is completed by grounding through the contact breaker. Contact breaker is contained in the contact breaker housing at the right end of the crankshaft. There are two contact breakers which are 180° out of phase. One of the breakers furnishes high voltage current to spark plugs 1 and 4; the other breaker furnishes current to plugs 2 and 3. The contact breakers ignite the spark plugs in a firing sequence of 1, 2, 4 and 3 which is indicated on the high tension plug cords. Since no distributor is used, the construction is simple and the system is easy to service.

SERVICE DATA

Ignition coil 3 point spark gap opening	7 mm min. (0.27 in.)
Spark plug Type (standard) Plug gap	NGK D-7 ES, DENSO X 22 ES 0.6~0.7 mm (0.023~0.027 in.)
Contact breaker Point gap Spring force	0.3~0.4 mm (0.012~0.016 in.) 680~850 g (1.43~1.87 lbs.)
Condenser Capacity Insulation resistance	0.24 μF±10% Over 10 MΩ (1,000 megger)
Spark advancer Start of advance (crankshaft speed) Full advance (crankshaft speed) Advance angle	 1,150 rpm 2,300~2,500 rpm 25°

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Ignition Coil

The ignition coil consists of a primary coil with 420 turns of copper wire wound around an iron core of laminated silicon steel sheets. A secondary coil with 13,000 turns of wire is wound on top of the primary coil. Each secondary coil has two high tension cords to two spark plugs.

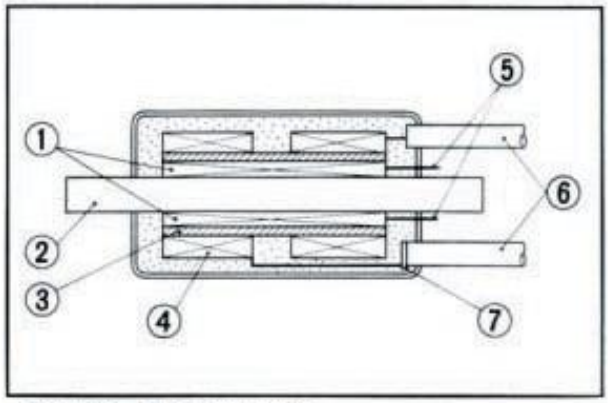

Fig. 270 ① Primary coil
② Iron core
③ Bobbin
④ Secondary coil
⑤ Primary terminal
⑥ High tension cord
⑦ High tension terminal

A. Disassembly

1. Open the seat and remove the fuel tank.
2. Disconnect the ignition coil leads. (yellow, blue and black/white)
3. Unscrew the two ignition coil mounting bolts, and separate the ignition coil from the frame.

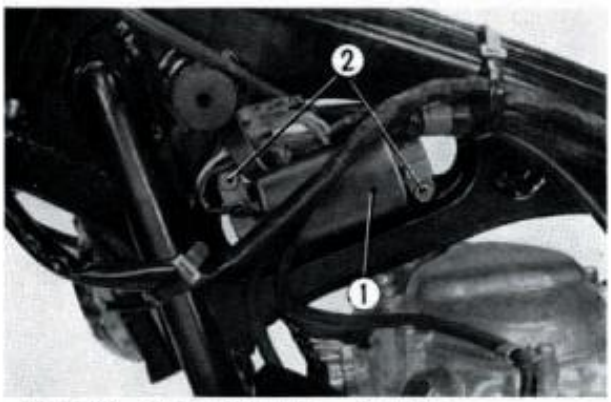

Fig. 271 ① Ignition coil ② Bolts

B. Inspection

1. Ignition coil continuity test
   Primary coils:
   Check for continuity between the terminals of the primary coil.
   Right coil: yellow and black/white leads
   Left coil: blue and black/white leads
   Secondary coils
   Check for continuity between the terminals of the high tension cords.
   If there is no continuity, the coil is open and must be replaced.

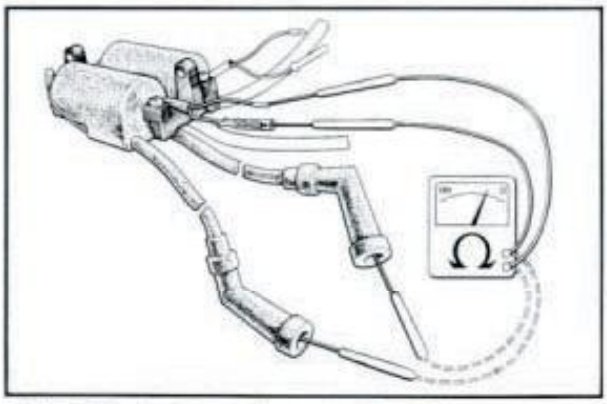

Fig. 272 Ignition coil continuity test

Fig. 273 Ignition coil performance test

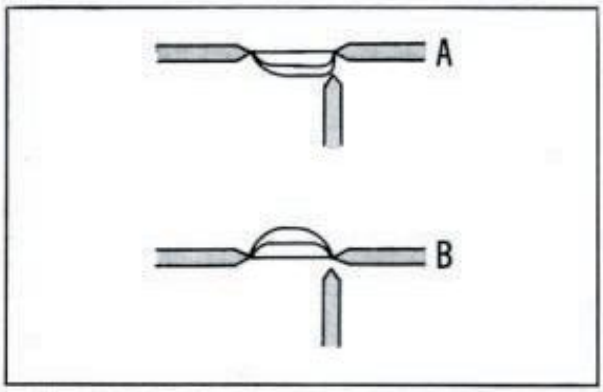

Fig. 274 Spark performance

Ignition coil perfomance test

Coil may test satisfactorily for continuity but it may not perform satisfactorily due to deterioration from long use, therefore, performance should be checked to determine its condition.

Connect the service tester power cord to a 12 V battery and ground the ground cable. Connect the ignition primary test lead to the tester and connect the opposite terminal ends to the primary terminals of the coil. Connect red test lead to the black terminal of the ignition coil and the white test lead to the yellow cord of the left coil (to the blue cord for the right coil).

Position the selector knob to COIL TEST. Adjust the three point spark tester to the maximum distance spark is maintained and then measure this distance. The coil is satisfactory if the distance is greater than **7 mm. (0.27 in.)**

Note:

Since a dual sparking ignition coil is used, note the spark condition. If the spark appears as B in Fig. 274, the connection to the primary coil is reversed.

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Spark plug

A. Removal

1. Remove any dirt from around the spark plug by using compressed air.
2. Remove the spark plugs with a plug wrench.

B. Inspection

Inspect the spark plug for worn electrodes, excessive gap, fouled condition and damaged porcelain insulator.

1. Clean dirty spark plug with a plug cleaner or wire brush.
2. Measure the electrode gap with a feeler gauge and, if necessary, adjust to the specified gap.
   Standard gap: **0.6~0.7 mm (0.023~0.027 in.)**
3. Replace the spark plug if the porcelain insulator is damaged, or the gasket if it is damaged or distorted.
   Standard spark plug: **D-7ES (NGK), X22ES (DENSO)**

C. Reinstallation

1. Install the spark plugs in the reverse order of removal.
   Torque: **1.5~2.0 kg-m (11~14 ft-lbs)**

Note:

1. **Exercise care not to drop the plug gasket.**
2. **Loose plug will not properly dissipate the heat and may result in engine malfunction.**

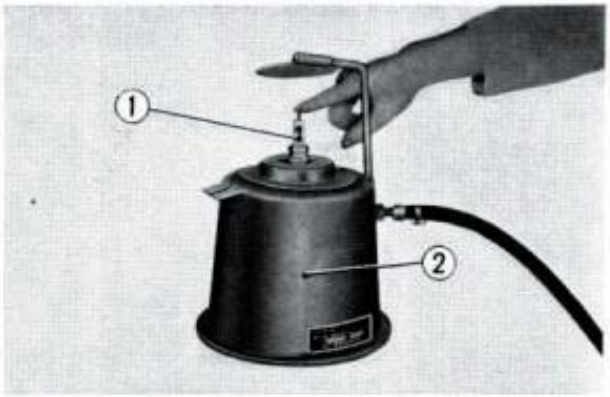

Fig. 275 ① Spark plug ② Spark plug cleaner

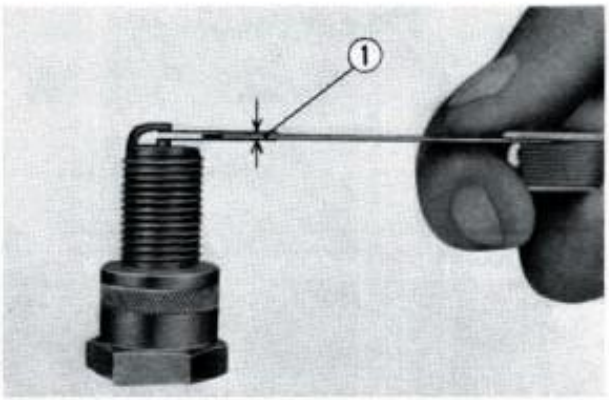

Fig. 276 ① Feeler gauge

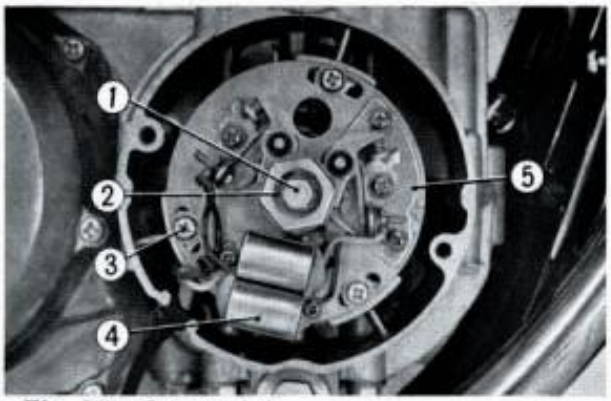

Fig. 277 ① 6mm bolt ② Special washer ③ Screws ④ Condensers ⑤ Contact breaker plate

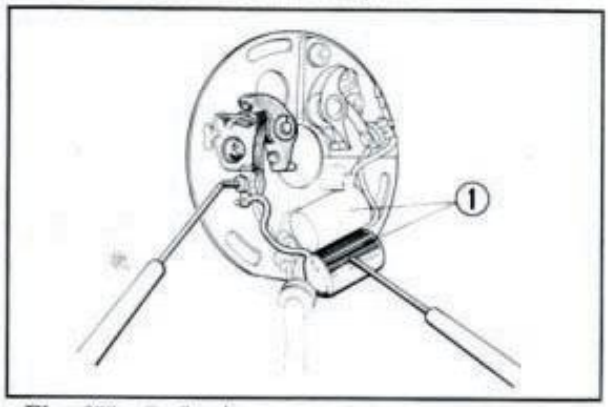

Fig. 278 ① Condenser

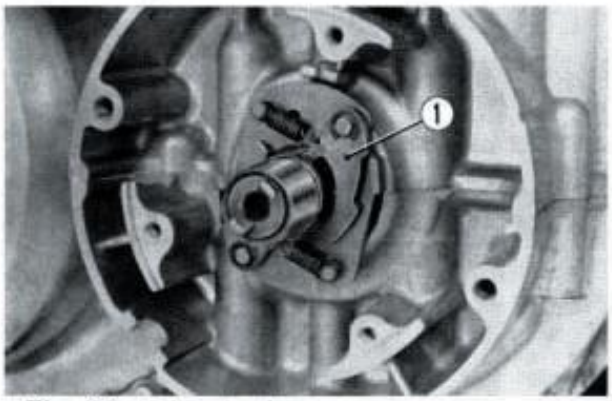

Fig. 279 ① Spark advancer

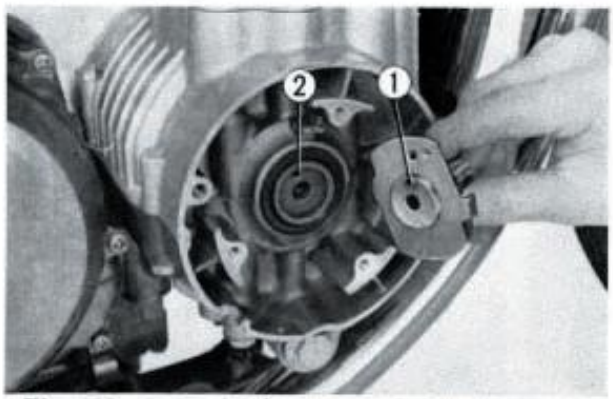

Fig. 280 ① Spark advancer ② Crankshaft

Contact Breaker and Condenser

A. Disassembly

1. Remove the point cover.
2. Disconnect the leads (yellow, blue) at the connectors located at the center of the frame.
3. Unscrew the 6mm bolt, remove the special washer, loosen the base plate mounting screws, and then remove the contact breaker assembly.

B. Inspection

- For adjustment of the breaker point and ignition timing, refer to the section "Maintenance Operations".
- Condenser

  Measure the capacitance of the condenser using the service tester.

  Standard value: **0.22~0.26 μF**

Note:
The points should be open when testing.

Spark Advancer

A. Disassembly

1. Remove the point cover and contact breaker assembly.
2. Remove the spark advancer from the spark advancer shaft.

B. Inspection

1. Clean dust and foreign matters from friction surfaces, and assure that operation is smooth.
2. Check spring tension, and advancer pin wear.

   Standard spring tension:

   680~850gr. (1.43~1.87lbs)

C. Reassembly

1. Install the dowel pin by aligning the hole.
2. Reassemble in the reverse order of removal.

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

3. CHARGING SYSTEM

The charging system for the CB500 is made up of the exciter field 3-phase AC generator, rectifier, voltage regulator and the fuse. The generator consists of the field coil, stator coil and the rotor; it does not contain slip rings or brushes.

In order for the stator coil to produce a constant voltage, the current from the battery to produce the exciter field is regulated to very close limits by the dual contact regulator. The output from the generator is rectified by the silicon rectifier before being sent to recharge the battery.

The generator performs two functions depending upon the charge condition of the battery. The electrical current from the battery flows through the switch and into the regulator. When the battery voltage is lower than normal (less than 13.5 V at the battery terminal), the current flows through the upper contact and to the field coil. The strength of the magnetic field is dependent upon the strength of the battery voltage. When the battery terminal voltage is 12 V, the field coil current is 1.6 A. This produces an output voltage of corresponding strength which is used to charge the battery.

When the battery voltage exceeds approximately 14.5 V, the armature coil pulls the armature away from the upper contacts and closes the lower contacts to insert a 10Ω resistance into the field coil circuit. The current to the field coil is thus reduced to 0.7 A and, consequently, a lower voltage is produced by the generator, limiting the amount of charge to the battery. This function of inserting or removing the resistance into the generator field coil is performed by the voltage regulator in accordance with the charge condition of the battery.

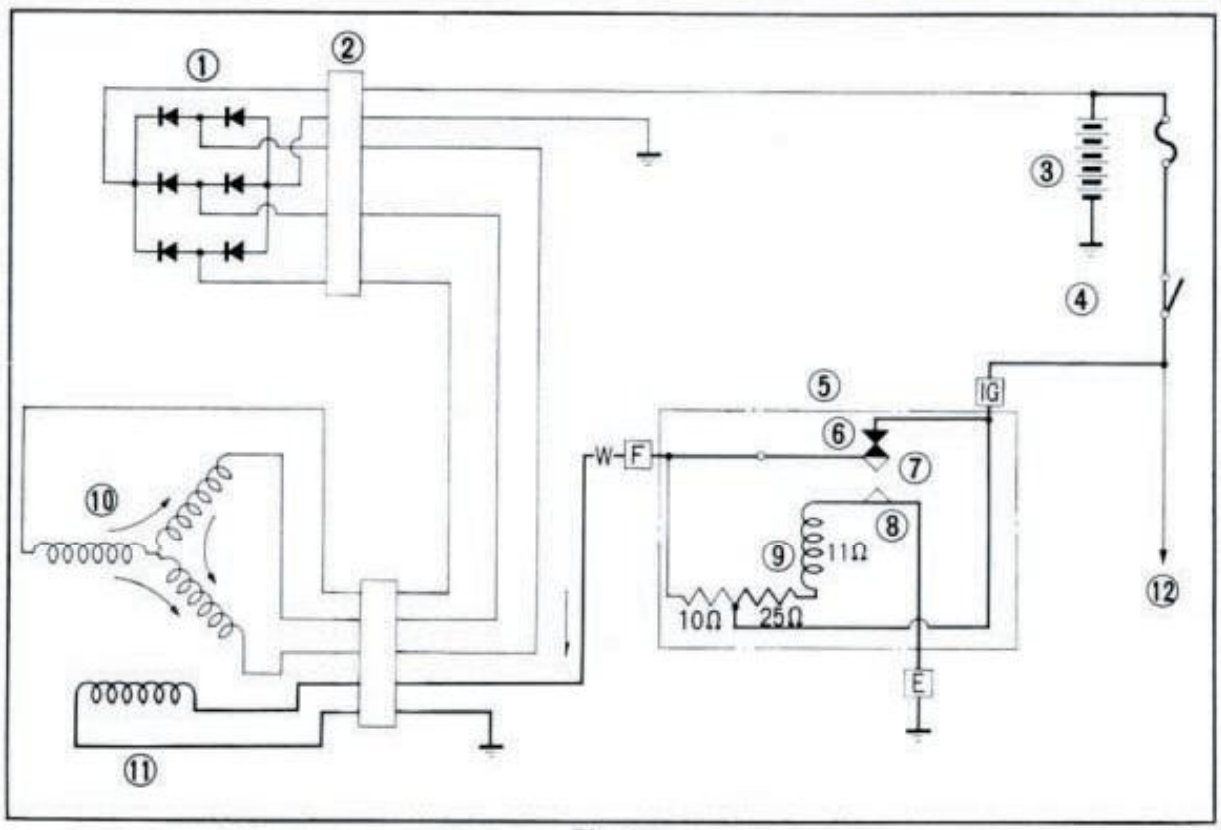

Fig. 281

① Silicon rectifier
② Coupler
③ Battery 12 V, 12 AH
④ Main switch
⑤ Regulator
⑥ Upper contact
⑦ Moving contact
⑧ Lower contact
⑨ Relay coil
⑩ Stator coil
⑪ Field coil
⑫ To load

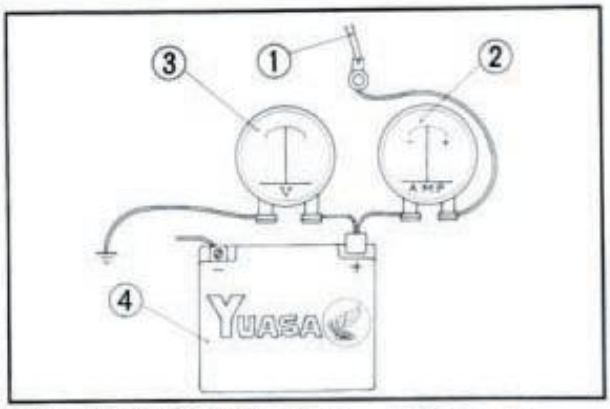

Fig. 282 ① Red/white lead ③ Voltmeter ② Ammeter ④ Battery

Charging Test

1. Perform the test using ammeter and voltmeter.
2. The battery charge condition is determined by measuring the specific gravity of the battery electrolyte. If the specific gravity is lower than **1.26** (at 20°C/68°F), recharge the battery so that the specific gravity is up to **1.26~1.28** (at 20°C/68°F), and then perform the following test.
3. Disconnect the battery cable from the ⊕ terminal of the battery, and connect it to the ⊕ side of the ammeter.

   Next, connect the ⊖ side of the ammeter to the ⊕ terminal of the battery.

   Connect the ⊕ side of the voltmeter to the ⊕ end of the battery cable, and ground the ⊖ side of the voltmeter. (Fig. 282)
4. Start the engine, operate the engine under both the NIGHT RIDING and DAY RIDING conditions and check to see if the measured values conform to those specified in the table below.

   If the values are less than those specified, adjust the regulator.

Note:

The charge condition of the battery may cause the charge current to vary slightly.

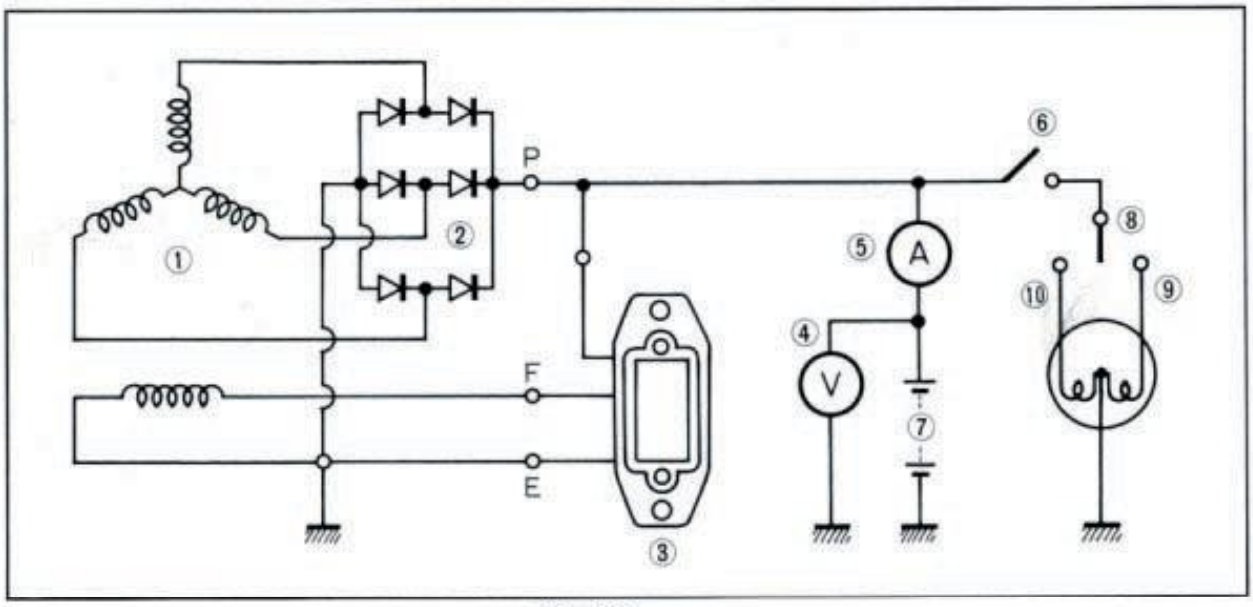

Fig. 283

① A. C. Generator
② Silicon rectifier
③ Voltage regulator
④ Volt meter
⑤ Ammeter
⑥ Main switch
⑦ Battery
⑧ Headlight switch
⑨ Headlight low beam
⑩ Headlight high beam

Engine RPM / Charging current (A)	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
Day riding	6.5	0	2.4	1.3	1.0	1.0	0.8	0.6
Night riding	2-3	1	1	1	1	1	1	1
Battery terminal voltage (v)	12	12.4	13.2	14.5	14.5	14.5	14.5	14.5

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

A.C. Generator

Specifications

Type and maker	LD 110-01, Hitachi
Output	150 W
Battery voltage	12 V
Polarity	⊖ ground
Charging speed	1000-9000 rpm
Weight	3 kg (6.6 lbs)

A. Disassembly

1. Remove the generator cover and pull out the rotor using the rotor puller (special tool No. 07011-21601).
2. Unscrew the three 6 mm screws from inside the generator cover and remove the stator coil.
3. Unscrew the three 6 mm screws from the outside the generator cover and remove the field coil.

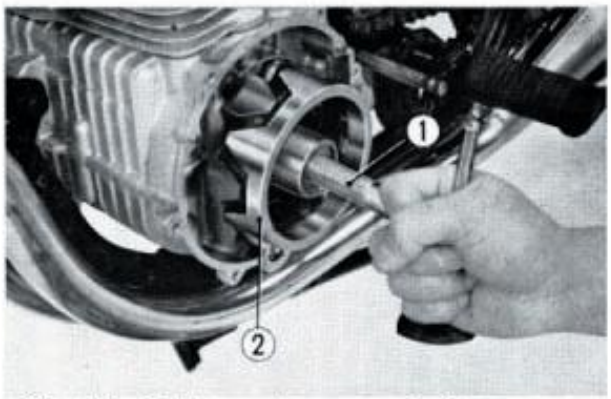

Fig. 284 ① Rotor puller ② Rotor

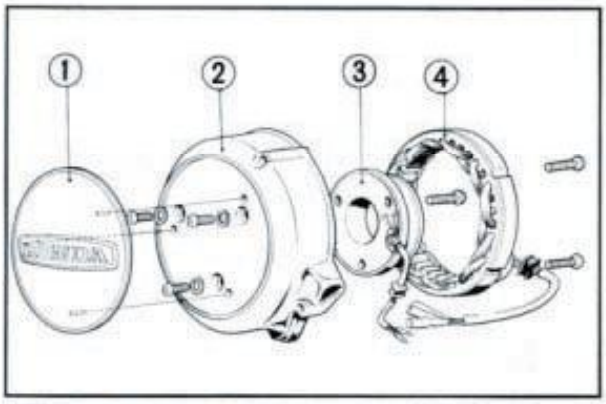

Fig. 285 ① Side cover ② Generator cover ③ Field coil ④ Stator coil

B. Inspection

1. Field coil continuity test.
   Check continuity between the two leads (white, green) of the field coil using a tester. If there is continuity, the coil is satisfactory.

   Note:
   Test can also be performed without removing the field coil.
   Standard resistance value: **4.9 Ω ±10%**
2. Stator coil continuity test.
   Check continuity between the three leads (yellow) of the stator coil using a tester. If there is continuity throughout, the coil is satisfactory.

   Note:
   Test can also be performed without removing the coil.
   Standard resistance value: **0.35 Ω ±10%**

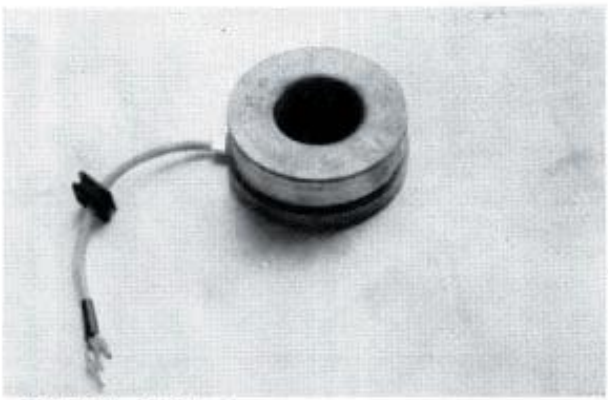

Fig. 286 Field coil

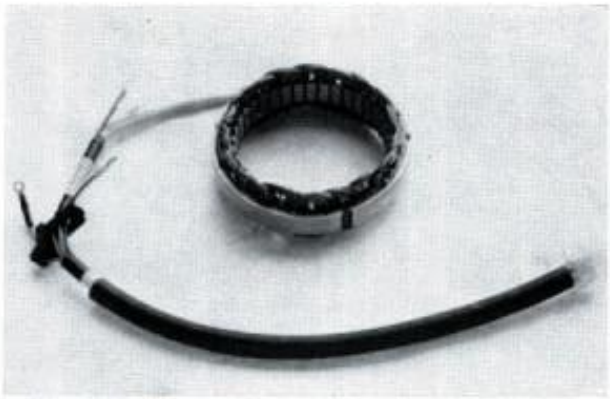

Fig. 287 Stator coil

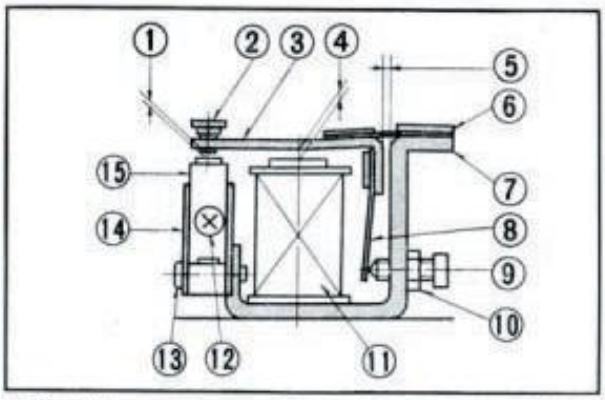

Fig. 287

① Point gap
② Upper contact
③ Armature
④ Core gap
⑤ Yoke gap
⑥ Spring
⑦ Yoke
⑧ Adjusting spring
⑨ Voltage adjusting screw
⑩ Lock nut
⑪ Coil
⑫ Point gap adjusting screw
⑬ Core gap adjusting screw
⑭ Contact set
⑮ Lower contact

Fig. 289 ① Regulator

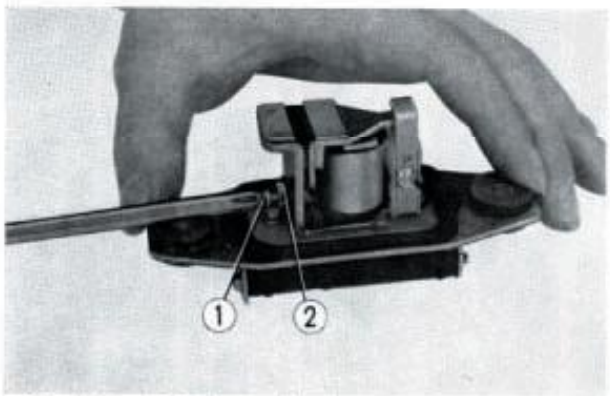

Fig. 290 ① Voltage adjusting screw
② Lock nut

Regulator

The regulator is a dual contact type. If maintains a constant voltage by placing the resistance circuit into the field coil circuit when the generating voltage rises to a certain value, and cutting out the resistance circuit when the voltage drops below a set limit.

A. Disassembly

1. Disconnect the leads at the connectors and unscrew the two 6 mm regulator mounting bolts.
2. Unscrew the two screws and remove the regulator cover.

B. Inspection and Adjustment

Regulating voltage adjustment

1. To adjust for low charge current or low battery voltage, loosen the lock nut on the voltage adjusting screw and turn the adjusting screw clockwise. When the regulator is set too high, turn the adjusting screw counterclockwise.
2. Upon completing the adjustment, recheck regulator performance after installation.

Core gap adjustment

Measure the core gap with a feeler gauge. If it requires adjustment, loosen the core gap adjusting screw and move the point body up or down.

Standard core gap value:

0.6~1.0 mm (0.02~0.40 in.)

Point gap adjustment

Measure the point gap with a feeler gauge. If it requires adjustment, loosen the point gap adjusting screw and move the lower point up or down. Standard point gap value:

0.2 mm (0.008 in.)

Note: If the points are pitted or fouled, polish with a #500~600 emery paper.

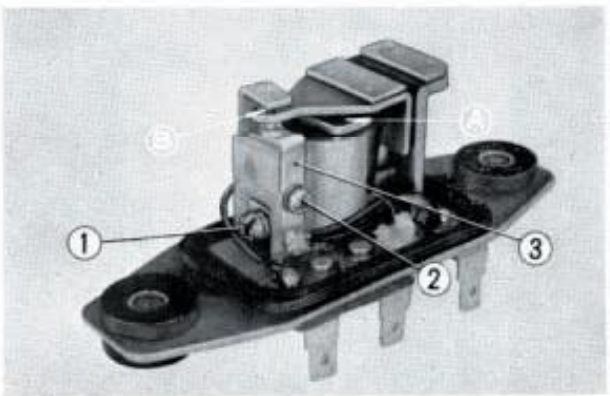

Fig. 291 Ⓐ Core gap
Ⓑ Point gap
① Core gap adjusting screw
② Point gap adjusting screw
③ Lower point

Courtesy of Honda4Fun
www.hondafour.com www.honda4fun.com

Silicon Rectifier

Inspection

The condition of the silicon rectifier is tested by disconnecting the electrical connections and testing the rectifying function in both the normal and reverse directions. Continuity in the normal direction only indicates good condition. Continuity in both direction indicates a defective rectifier.

Note:

1. **Do not use a megger for the test as the high voltage will damage the silicon diodes.**
2. **Observe the polarity of the battery. Connecting the battery terminals in reverse will shorten the life of the battery as well as causing a large current to flow through the electrical system, causing damage to the silicon rectifier, and also destroying the wire harness.**
3. **Do not operate the generator at a high RPM with the "P" terminal (red/white cord from the magnetic switch) of the silicon rectifier disconnected. The high voltage generated may damage the silicon rectifier.**
4. **When charging the battery mounted on the motorcycle from an external source with high charge rate such as a "quick charge", the wiring to the silicon rectifier should be disconnected at the coupler to prevent damage.**

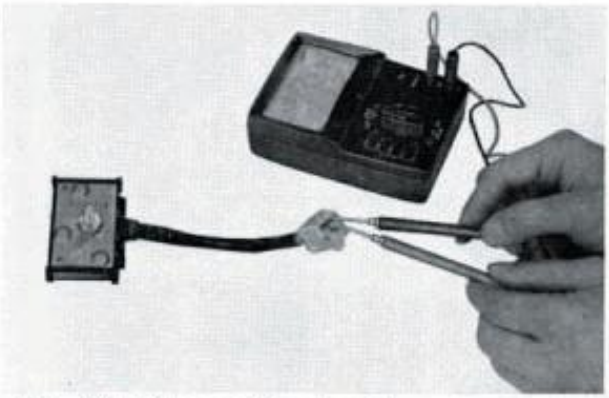

Fig. 292 Silicon rectifier inspection

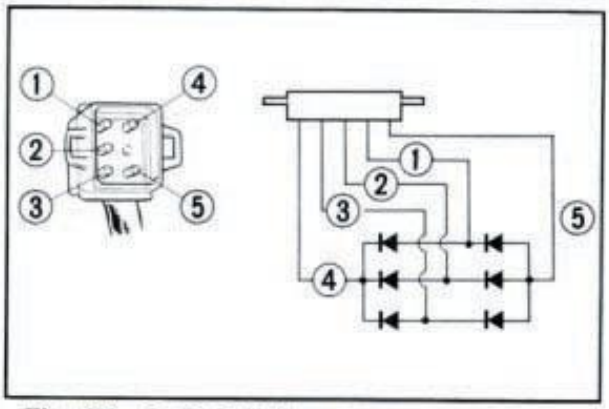

Fig. 293 ①, ②, ③ Yellow
④ Yellow/White
⑤ Green

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

4. STARTING SYSTEM

The starter is a device which converts the electrical energy of the battery to the mechnical energy to crank the engine for starting. The starting circuit consists of a push button switch mounted on the right side of the handle bar which, when the starter button is pressed, energizes the starter magnetic switch and closes the contacts of the starter circuit. This permits approximately 120 A of current to flow from the battery to the starting motor, which then rotates the engine to perform the starting.

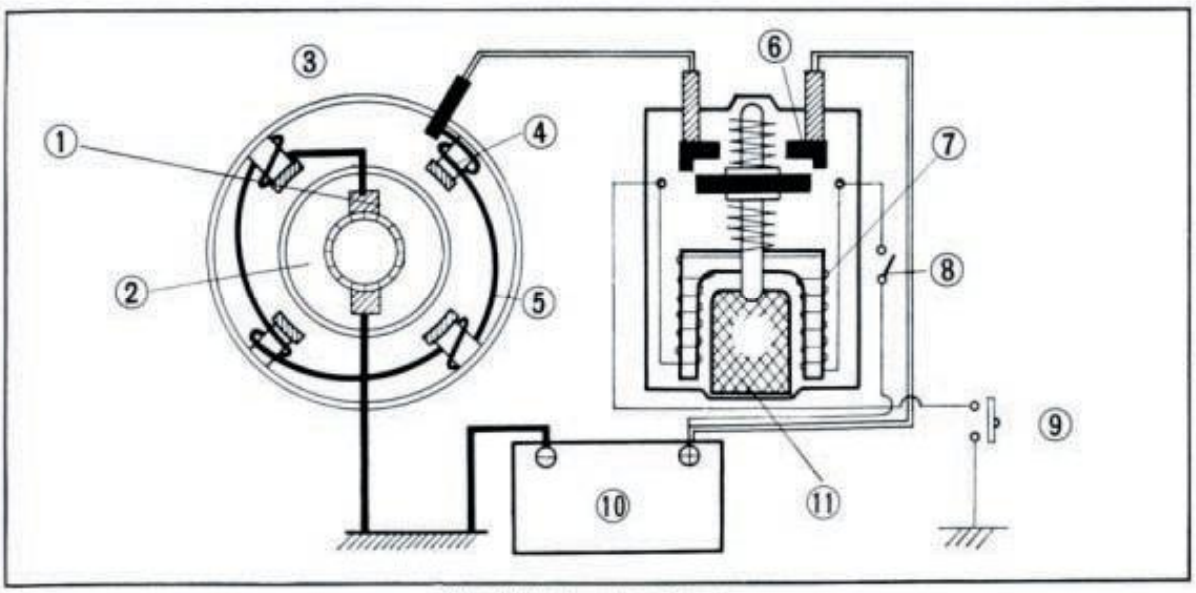

Fig. 294 Starting Circuit

① Brush
② Armature
③ Starting motor
④ Pole
⑤ Field coil
⑥ Starter magnetic switch
⑦ Electromagnet
⑧ Ignition switch
⑨ Starter button
⑩ Battery
⑪ Plunger

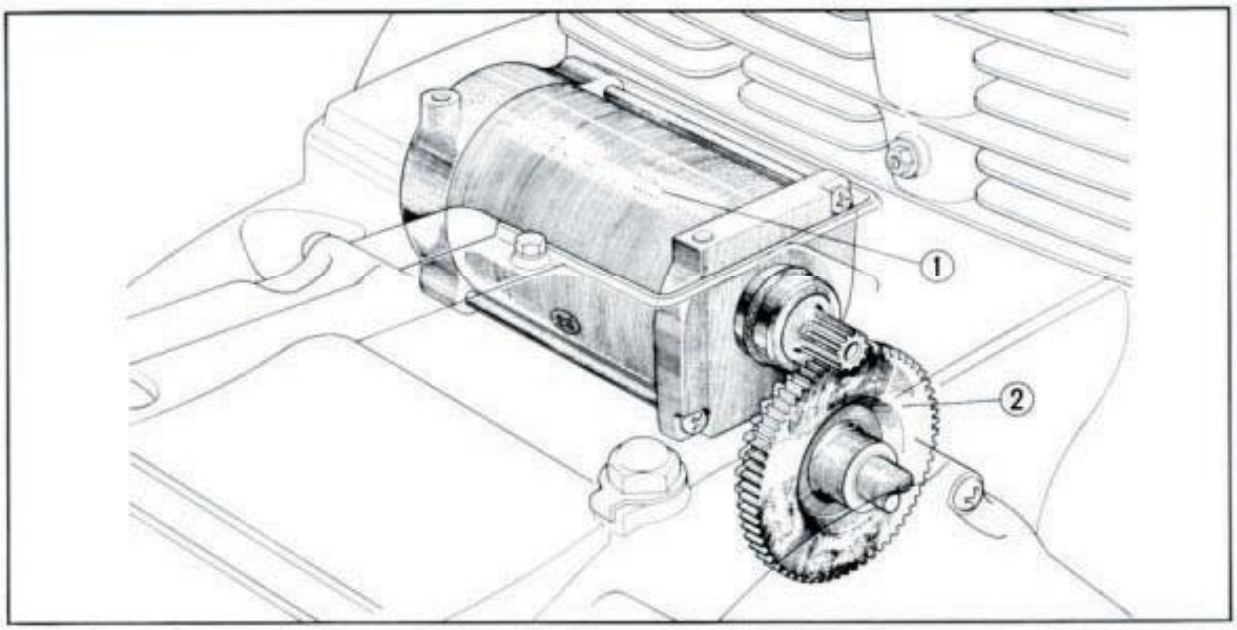

Fig. 295 Starting motor installation

① Starting motor
② Starter reduction gear

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

Starting Motor

The starting motor is mounted on the crankcase behind the cylinder and drives the crankshaft through the starting clutch.

Specifications

Rated voltage	12 V
Rated output	0.6 KW
Rated operation	Continuous for 30 seconds

	Without load	With load
Voltage	8.5 V	11 V
Amperage	35 A	120 A
Torque	—	0.12 kg-cm (0.86 ft-lbs)
Revolution	11000~ 20000 rpm	3200 rpm

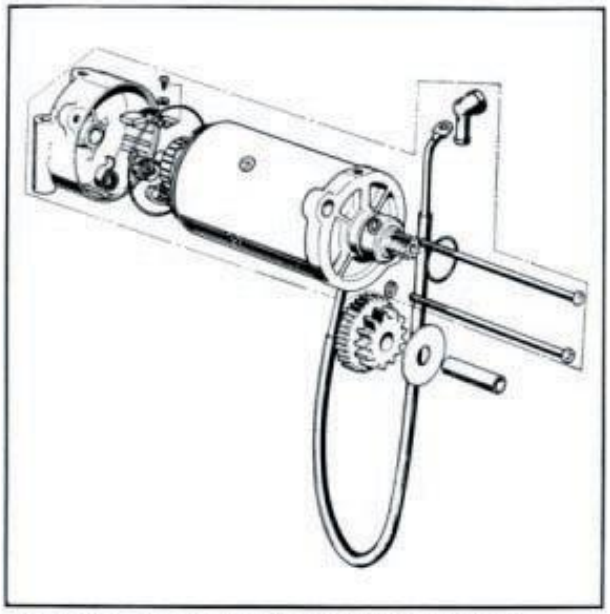

Fig. 296 Starting motor disassembly drawing

A. Disassembly

1. Disconnect the starting motor cable at the magnetic switch.
2. Remove the starting motor cover, left crankcase cover and unscrew the two 6 mm starting motor mounting bolts.
3. Starting motor can now be pulled out.
4. Unscrew the two 6 mm screws and remove the starting motor side cover.

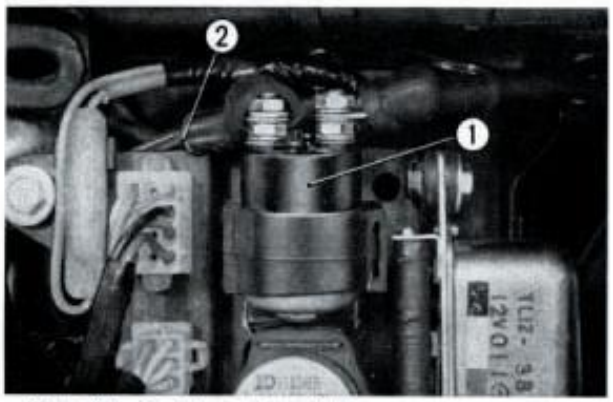

Fig. 297 ① Magnetic switch
② Starting motor cable

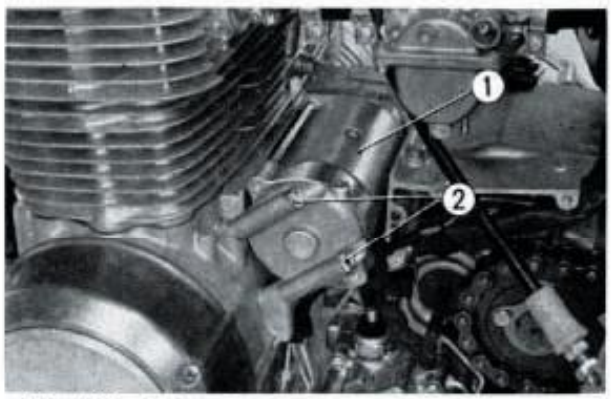

Fig. 298 ① Starting motor
② 6 mm bolts

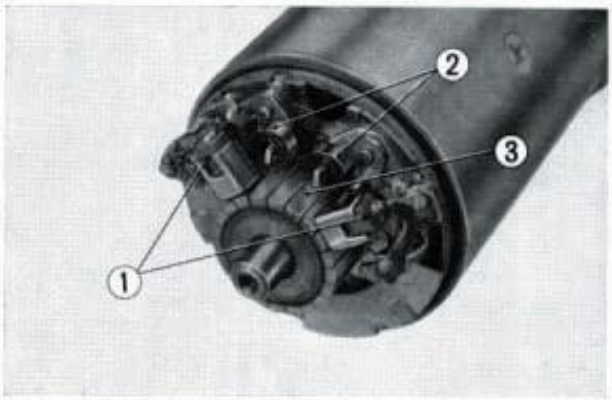

Fig. 299 ① Carbon brushes
② Springs
③ Commutator

B. Inspection

1. Carbon brush inspection
Worn carbon brush, pitted or rough contact surface and weakened brush spring will cause starting difficulty, therefore, they should be replaced.
2. Commutator cleaning
Dirty commutator will give poor starting motor performance.
Surface of the commutator should be polished with a fine grade emery paper and completely washed before reassembly.

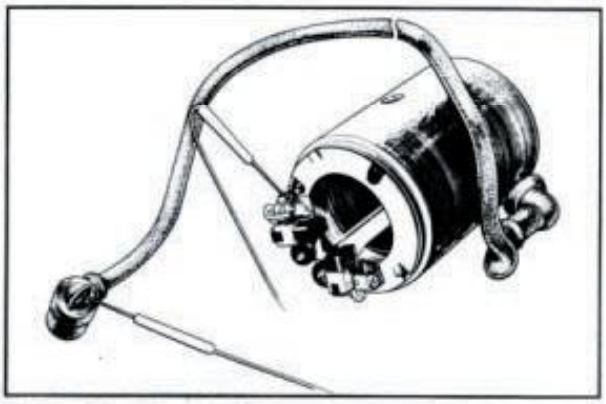

Fig. 300 Stator coil inspection

3. Stator coil inspection
Check continuity between the brush wired to the stator coil and the starting motor cable. Lack of continuity indicates an open stator coil and should be replaced.

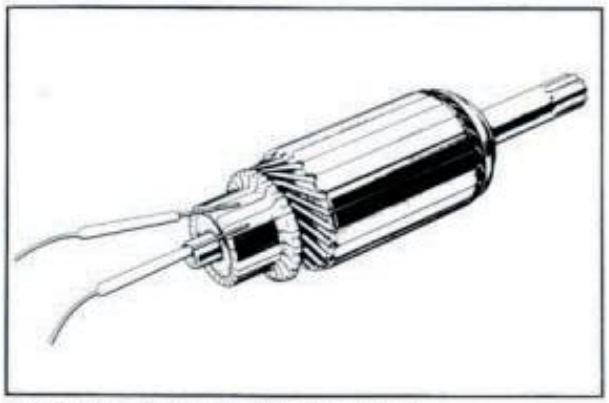

Fig. 301 Armature coil inspection

4. Armature coil inspection
A grounded armature coil will render the starting motor inoperative.
Perform a continuity test between the commutator and the core. A continuity condition indicates a grounded stator coil and should be replaced.

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Starter Magnetic Switch

The starting motor requires a large current of approximately 100 A to operate. To minimize resistance, a large cable is used for wiring, also, a switch with heavy duty contacts is required. Sparking across the contacts will result, as well as resistance depending upon the contact pressure, when the contacts are opened suddenly to shut off the flow of large current. To cope with these conditions, a magnetic switch is used separately which is operated electrically by a small current through a push button starter switch.

Inspection

1. Primary coil continuity test.
   If there is no continuity, the primary coil is open.
   - If a clicking noise is heard when a 12 V battery is connected to the two leads of the coil, the primary coil is satisfactory.
2. After long use, the magnetic switch contacts will become pitted or burnt from the large current which flows across it, and gradually build up resistance which may prevent the current from flowing. Connect 12 V to the primary coil leads of the magnetic switch. If there is no continuity across the switch contacts, the switch is defective.

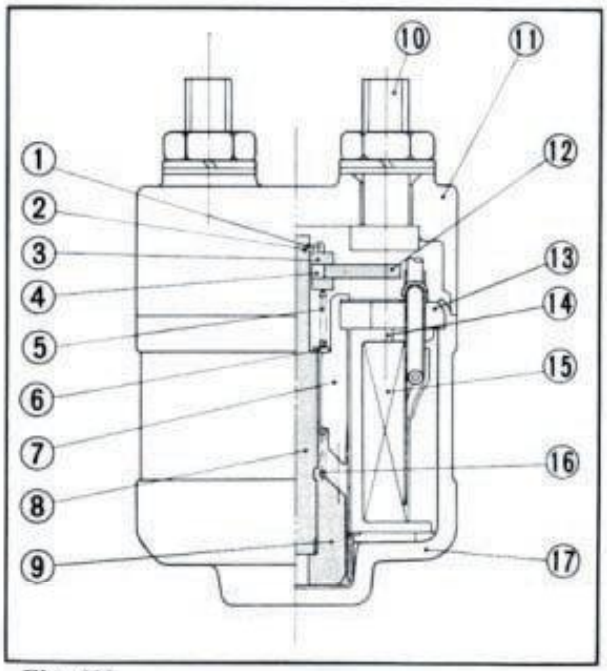

Fig. 302

① Stopper
② Stopper holder
③ Washer
④ Roller A
⑤ Contact spring
⑥ Flat washer
⑦ Plunger holder
⑧ Plunger shaft
⑨ Plunger
⑩ Contact bolt
⑪ Case
⑫ Contact plate
⑬ Yoke
⑭ Coil bobbin
⑮ Coil complete
⑯ Return spring
⑰ Body

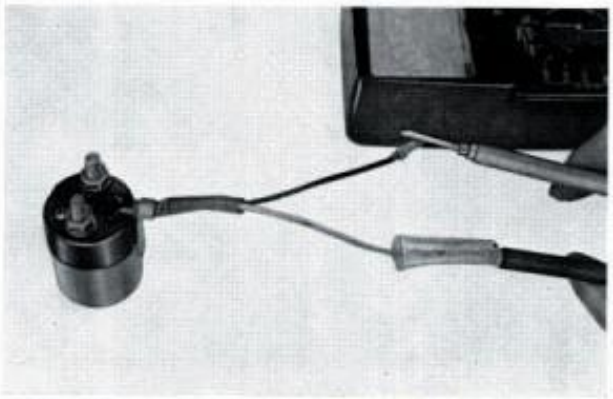

Fig. 303 Primary coil continuity test

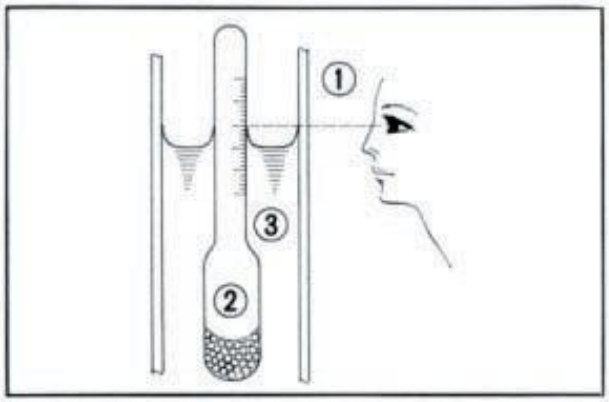

Fig. 304 ① Eye level ③ Electrolyte
② Hydrometer

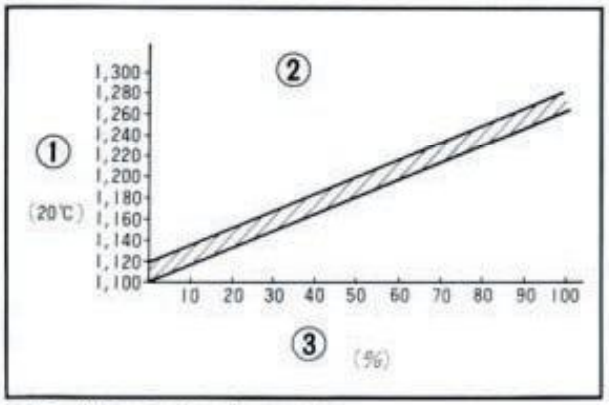

Fig. 305 ① Specific gravity
② Relation between specific gravity
③ Residual charge (%)

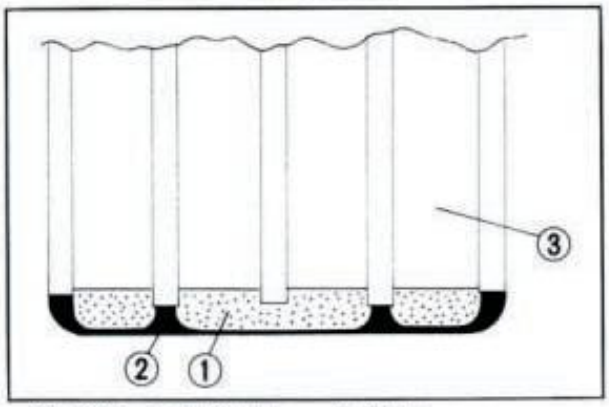

Fig. 306 ① Sediment ③ Plates
② Battery case

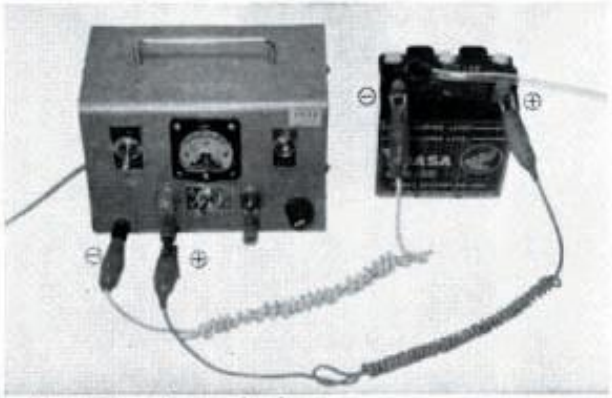

Fig. 307 Charger hook-up

Battery

A. Specification

Type	12N 12A-4A-1
Voltage	12 V
Capacity	12 AH

B. Specific gravity measurement

Battery electrolyte is measured with a bulb type hydrometer. When the specific gravity is below 1.200 (at 20°C), the battery should be recharged.

When making a reading, the hydrometer should be held vertical with the electrolyte liquid level, held at the eye level and the value on the floating scale read at point where the liquid separates from the stem of the float.

C. Inspection and replenishment

1. Electrolyte in each cell of the battery should be inspected every half month to a month, and distilled water added to bring the level to the upper mark whenever the electrolyte level is below the level mark.
2. Whenever there is rapid lowering of the electrolyte level, the charging system should be inspected.
3. Periodically measure the specific gravity. After adding distilled water, allow the battery to be charged and the electrolyte sufficiently agitated before making the measurement.
4. Primary battery troubles are due to corrosion around the connetors and terminals causing poor contact, separation of the battery paste, and sulfation (battery which is left in a discharged condition for a long period will have lead sulfate formed on the plates and recharging will not restore it to its original condition), therefore, the inspection should be performed periodically and thoroughly.

Note:
When sediment are formed at the bottom as shown in the figure, the battery should be replaced.

D. Battery charging

(Caution)

1. Refrain from charging the battery at a fast rate (quick charge) as it shortens battery life. When rapid charging is necessary, limit the charging rate to maximum of 2.0 A.
2. Hydrogen gas is generated during the charging process, therefore, keep fire away.
3. After battery charging is completed, wash the battery with water to remove spilled electrolyte, and apply grease to the terminals.

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

5. ELECTRICAL EQUIPMENTS

1. Main switch inspection
With the switch in both ON and OFF positions check to see that the continuity conditions in the chart below are satisfied. The switch is defective if there is no continuity where specified, or if there is continuity where not specified.

		BAT	IG	TL_1	TL_2
Color of cords		Red	Black	Brown/white	Brown
Key position	OFF				
	1	○	○	○	○
	2	○			○

2. Front stop switch inspection
Apply tester lead probes to the terminals of the front stop switch cords (black, green/yellow), operate brake lever and check for continuity.
- Take into consideration the lever play **2~5 mm (0.08~0.2 in.)**.
The stop light should come on when the brake lever travels beyond the play in the lever.

3. Rear stop switch inspection
After making sure that the stop switch spring is disconnected, apply tester lead probes to the switch terminals (green/yellow, black cords) and check for continuity. When the brake pedal is depressed 20 mm (0.8 in.) at the front end of the pedal, the stop light should come on at this point.
Adjustment.
If the stop light is late in coming on, turn the adjuster nut clockwise, and if too early, turn counterclockwise.

4. Horn Inspection
- Check for continuity across the horn lead terminals.
- Alternate method is to connect the horn to a fully charged 12 V battery and check its operation.

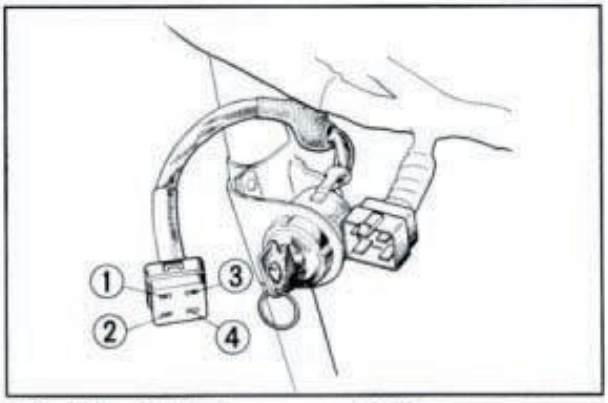

Fig. 308 ① Black ③ Brown ② Brown/white ④ Red

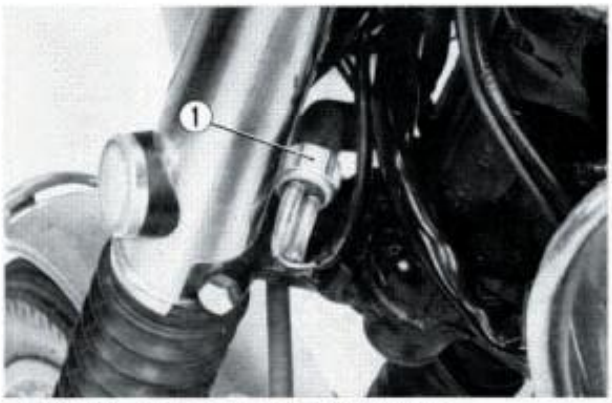

Fig. 309 Front stop switch inspection
① Front stop switch

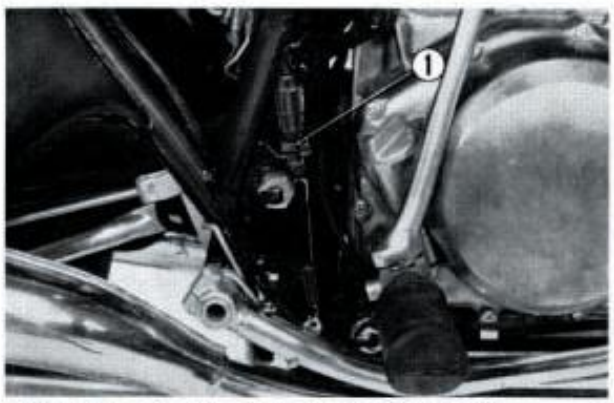

Fig. 310 ① Rear stop switch adjuster nut

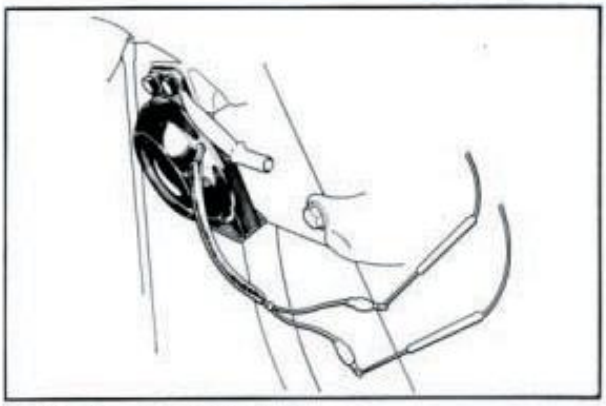

Fig. 311 Horn continuity test

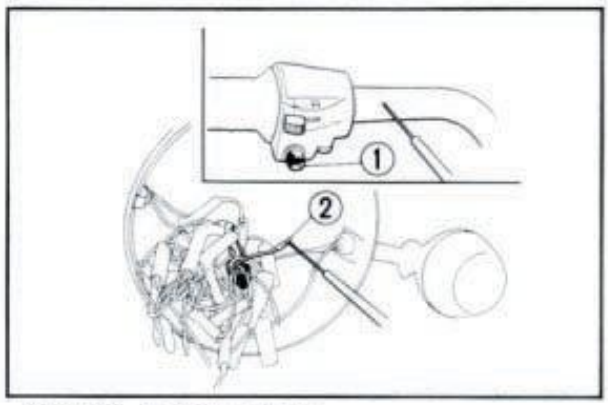

Fig. 312 ① Horn button
② Light green cord

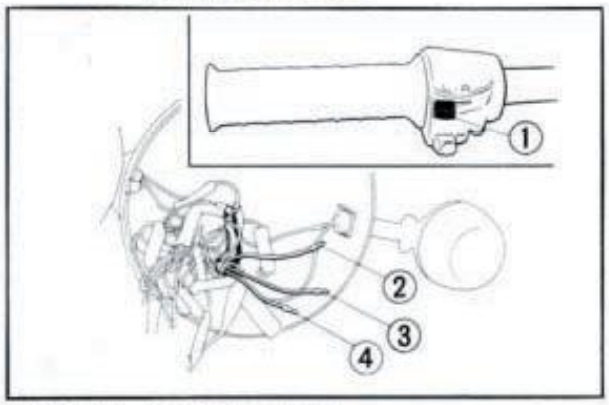

Fig. 313 ① Winker switch
② Light blue cord
③ Gray cord
④ Orange cord

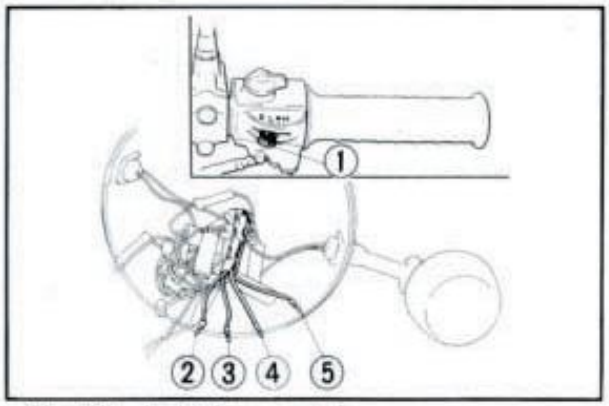

Fig. 314 ① Lighting switch
② Black cord
③ Blue cord
④ Brown/white cord
⑤ White cord

5. Horn button inspection
With the tester lead probes contact the light green cord terminal within the head light case and the the handle bar, and then press the horn button to check for continuity. If continuity exists, the horn button is satisfactory.

6. Winker switch inspection.
Disconnect the winker switch wiring within the head light case. Check continuity between the gray cord terminal and orange cord terminal (left winker), and between the gray cord terminal and light blue cord terminal (right winker) respectively of the winker switch. Continuity for the respective tests should exist according to the switch connections shown in the table below.

Knob	Blue cord	Gray cord	Orange cord
R	○	○	
OFF (center)			
L		○	○

7. Lighting switch inspection.
Inspect for broken wire and defective contact between the respective switch cords, using a tester. Continuity between the different cords should exist in accordance with the switching position table shown below. If continuity exists where not indicated the switch is defective.

Cord color		IG Black	HB Blue	TL Brown/ white	LB White
ON	H	○	○	○	
	P	○		○	
	L	○		○	○
OFF					

Courtesy of Honda4Fun www.hondafour.com www.honda4fun.com

8. Emergency switch and starter switch inspection

Inspect for broken wire and defective contact between the respective switch cords. Continuity between the different cords should exist in accordance with the switching position table shown below.

If continuity exist where not indicated, the switch is defective.

Emergency switch		
Cord color	Black	Black/white
ON	○	○
OFF		

Starter switch		
Cord color		Yellow/red
ON	○	○
OFF		

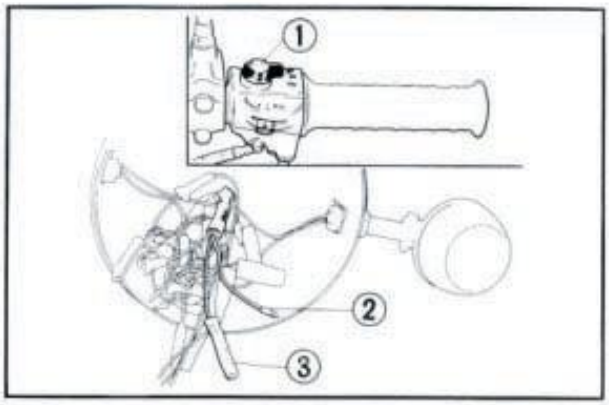

Fig. 315 ① Emergency switch ② Black ③ Black/white

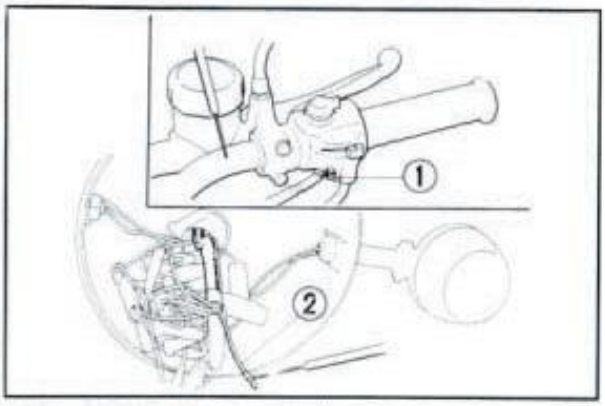

Fig. 316 ① Starter switch ② Yellow/red

9. Oil pressure switch inspection

Lubricating oil is supplied under pressure of **4~6 kg/cm²** (**56.8~85.3 lbs/in.²**) by the oil pump to various parts of engine. When the oil pressure drops, the oil supply becomes insufficient. The oil system is designed so that when the oil pressure drops below **0.5 kg/cm²** (**7 lbs/in.²**), the oil pressure switch operates and the warning lamp comes on.

Check the oil pressure switch for continuity without starting the engine and with the main switch on. If there is continuity, the switch is satisfactory. It is normal for the warning lamp to go out when the engine is started.

If the warning lamp does not go out after starting, and the pressure switch is satisfactory, the oil system should be inspected for trouble.

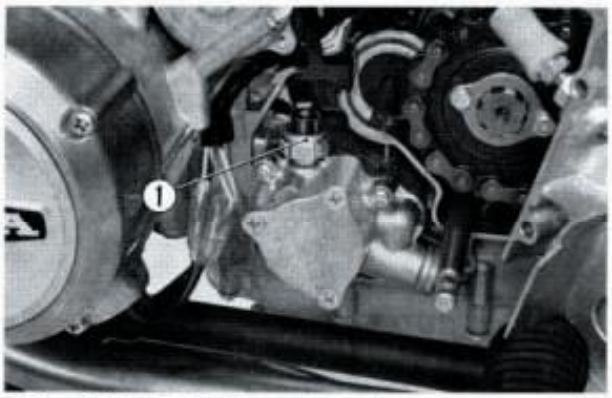

Fig. 317 ① Oil pressure switch

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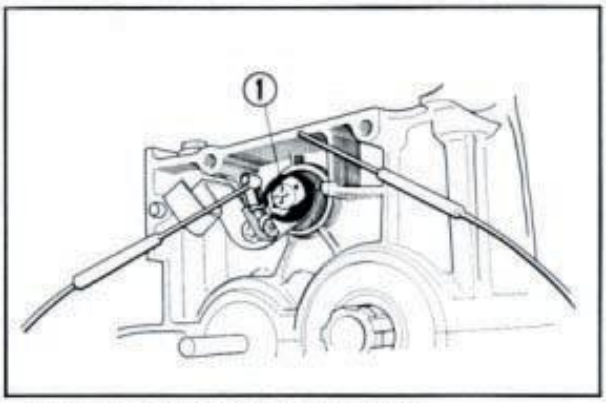

Fig. 318 Neutral switch inspection
① Neutral switch

10. Neutral switch inspection
The neutral switch is mounted on the left side of the upper crankcase. When the transmission is in neutral, the switch becomes grounded and the neutral pilot lamp comes on. Position the transmission in neutral, remove the left crankcase cover and check the continuity of the neutral switch. The switch is satisfactory if there is continuity.

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7. TROUBLE SHOOTING

ENGINE

Trouble	Probable Causes	Remedies
Engine does not start		
	1. Excessive wear of piston ring or cylinder	Replace
	2. Seized valve in valve guide	Replace
	3. Seized piston	Replace
	4. Faulty valve timing	Adjust
	5. Low or lack of compression prssure	Lap the valve to obtain good valve seating
	• Pressure leak	or replace
	5. Blown out cylinder head gasket	Replace
	6. Warped gasketing surface of the cylinder and cylinder head	Repair or replace
Poor engine idling	**Valve Mechanism**	
	1. Incorrect tappet clearance	Adjust to standard value
	2. Low or lack of compression pressure	Repair
	3. Excessive valve guide clearance	Replace valve and guide
Loss of power	1. Valve sticking open	Replace
	2. Incorrect seating of valve	Lap valve
	3. Weak or broken valve spring	Replace
	4. Faulty valve timing	Check valve timing and adjust if necessary
	5. Blown out cylinder head gasket	Replace
	6. Excessive wear of cylinder and piston	Replace
	7. Worn, weak or broken piston ring	Replace
	8. Loose spark plug	Retighten
Overheating	1. Heavy carbon deposit on combustion chamber and piston head	Remove carbon
	2. Lean fuel mixture	Adjust the carburetor
	3. Retarded ignition timing	Adjust ignition timing
	4. Low oil level poor quality	Add good grade oil
	5. Extended operation in low gear	
Backfire	1. Incorrect seating of inlet valve	Check the valve seating
	2. Faulty valve timing	Adjust
	3. Incorrect ignition timing	Adjust
	4. Excessive spark plug gap	Adjust the gap to 0.024~0.028 in (0.6~0.7 mm)
	5. Improper fuel	Replace
White exhaust smoke	1. Excessive wear of cylinder and piston	Replace the piston
	2. Overfilled engine oil	Adjust the oil level
	3. Excessively high oil pressure	Check the breather
	4. Poor quality oil	Replace with good quality oil
Black exhaust smoke	Rich fuel mixture	Adjust the carburetor

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Trouble	Probable Causes	Remedies
Difficult gear shifting	1. Improper clutch disengagement	Adjust the clutch
	2. Damaged gear or foreign object lodged in the gear	Replace the defective parts
	3. Gear shift fork inoperative	Repair or replace
	4. Incorrect operation of the gear shift drum stopper and change pedal	Repair or replace
	5. Mainshaft and countershaft out of alignment	Repair or replace
	6. High oil viscosity	Change the oil
Excessive high gear noise	1. Excessive gear backlash	Repair or replace
	2. Worn main and countershaft bearing	Repair or replace
Gear slip out	1. Worn fingers on gear shift fork	Replace
	2. Worn gear dog hole	Replace
	3. Worn spline	Replace
Clutch slippage	1. No play in the clutch lever	Adjust the clutch lever
	2. Weak or none uniform clutch pressure plate spring	Replace the weak spring
	3. Worn or glazed friction disc	Replace
Poor clutch engagement	1. Excessive play of clutch lever	Adjust clutch lever play
	2. Warped friction disc	Replace
	3. Warped pressure plate	Replace
	4. Bent main shaft	Replace
Pedal does not return	1. Faulty return spring	Replace
	2. Unhook return spring	Hook return spring
Kick starter gear does not rotate	1. Excessive wear of kick starter pawl	Replace
Engine does not start	**Carburetor**	
	1. Choke fully open	Close choke
	2. Carburetor air screw improperly set	Adjust air screw
	3. Air leaking into the cylinder head	Retighten carburetor connecting tube
	4. Clogged carburetor slow jet	Check, clean and retighten
	5. Clogged fuel valve or piping	Disassemble and clean
	6. Clogged vent hole in the fuel tank cap	Disassemble and clean
	7. No fuel in the tank	Fill tank with gasoline
Poor engine idling	**Carburetor**	
	1. Clogged or loose carburetor slow jet	Check, clean and retighten
	2. Improper float level	Adjust
	3. Incorrect air screw adjustment	Adjust
	4. Carburetor linkage mulfunction	Adjust
	5. Air leaks	Tighten all air passage connection
Improper running of engine	**Carburetor**	
	1. Jet size too small	Replace with larger size jet
	2. Improper float level	Adjust
	3. Clogged carburetor main jet	Clean and retighten
	4. Carburetor linkage mulfunction	Adjust
	5. Air leaks	Tighten all air passage connection

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CHASSIS

Trouble	Probable Causes	Remedies
Heavy steering	1. Steering stem excessively tightened	Loosen the steering stem nut
	2. Damaged steering stem steel balls	Replace
	3. Bent steering	Replace
	4. Low front tire pressure	Add air to the specified pressure of 1.8 kg/cm² (25.6 psi)
Front and rear wheel wobble	1. Loose steering stem mounting bolt	Retorque
	2. Worn front and rear wheel bearings	Replace bearing
	3. Front or rear wheel runout or distorted	Repair or replace
	4. Loose spoke	Retorque
	5. Defective tire	Replace
Soft suspension	1. Loss of spring tension	Replace
	2. Excessive load	
Hard suspension	1. Ineffective front fork damper	Repair
	2. Ineffective rear damper	Replace
Suspension noise	1. Front case or rear damper rubbing	Inspect cushion spring and case
	2. Interference between cushion case and spring	Repair or replace
	3. Faulty fork stopper rubber	Replace
	4. Insufficient front fork oil	Add damper oil
Defective brake	1. Front brake fluid	
	· Insufficent brake fluid	Add brake fluid
	· Air in the brake system	Bleed brake system
	· Worn brake pad	Replace pad
	· Worn piston	Replace piston
	· Worn or distorted front brake disc	Replace disc
	· Brake lever out of adjustment	Readjust
	2. Rear brake	
	· Worn brake lining	Replace
	· Worn brake shoe or poor contacts	Replace
	· Worn brake cam	Replace
	· Wet brake from water or oil	Clean
	· Worn brake shaft	Replace
	· Brake pedal out of adjustment	Readjust

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ELECTRICAL

Troubles	Probable causes	Remedies
Engine does not	1. Battery	
	· Discharged	Recharge or replace
	· Poor contact of battery terminals	Repair
	2. Main switch	
	· Open or shorted circuit, disconnected connections	Repair
	· Poor contact between main switch wire and wire harness	Repair
	3. Ignition coil	
	· Improperly insulated high tension coil	Replace
	· Open or shorted circuit in ignition coil	Replace
	4. Contact breaker	
	· Open circuit in the primary coil	Repair
	· Dirty ground point with oil or dust	Clean
	· Point gap out of adjustment	Readjust
	· Improperly charged condenser	Replace
Starting motor does not operate	1. Defective battery	Charge or replace
	2. Poor contact of magnetic switch	Repair or replace
	3. Poor contact of starting motor carbon brush	Repair or replace
Horn inoperative, poor sound or too weak sound	1. Horn	
	· Cracked diaphragm	Replace
	2. Horn button	
	· Poor grouuding	Repair
	3. Wiring	
	· Poor contact	Repair
	4. Adjusting screw	
	· Out of adjustment	Readjust
Tail light and head light inoperative	1. Fuse	
	· Blown fuse or hurnt bulb filament	Replace
	2. Bulb	
	· Burnt bulb filament	Readjust
	3. Switch	
	· Poor contact of lighting switch	Readjust
	4. Wiring	
Stop light inoperative	1. Bulb	
	· Burnt or broken bulb filament	Replace
	2. Front and tail stop light switch	
	· Malfunction of switch	Readjust
	3. Wiring	
	· Poor contact of leads	Readjust
Winker lamp blinks too fast or too slow	1. Bulb	
	· Blinks unusually fast : improperly connected relay	Replace
	2. Wiring	
	· Blinks too fast : bulb with unsitable wattage	Replace
	· Blinks too slow : burnt or broken bulb filament	Replace
	3. Defective relay	Replace

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Trouble	Probable causes	Remedies
Winker lamp inoperative	1. Winker lamp switch	
	· Poor contact of winker relay	Replace
	· Open circuit in winker relay coil	Replace
	2. Bulb	
	· Bulb wattage is smaller than rated wattage	Replace
	3. Relay	
	· Poor contact of winker relay	Replace
	· Improperly connected leads	Replace
No charging	1. Broken wire or shorted, loose connection	Repair or replace
	2. Faulty coil due to short or grounding	Replace
	3. Faulty or shorted silicon diode	Replace
	4. Broken or shorted lead wire at regulator	Repair or replace
	5. Regulator voltage at no load is too low	Readjust
Insufficient charging	1. Wiring	
	· Broken wire, intermittent shorting or loose connection	Repair, retighten
	2. Generator	
	· Shorting across layer in the field coil (resistance indicated in continuity test)	Replace
	· Shorting across layer in stator coil	Replace
	· Open circuit in one of the stator coil	Replace
	· Faulty or shorted silicon diode	Replace
	3. Regulator	
	· Voltage below specified value at no load	Readjust
	· Dirty of pitted points	Polish or replace
	· Coil or resistor internally shorted	Replace
	4. Battery	
	· Low electrolyte level	Add distilled water
	· Defective battery plates	Replace
Excessive charging	1. Wiring	
	P terminal circuit and F terminal circuit shorted resulting in split wound generator	Repair
	2. Battery	
	Internal short	Replace
	3. Regulator	
	· Excessive voltage at no load voltage	Repair
	· Improper grounding	Provide proper ground
	· Broken coil lead wire	Repair, replace
Unstable charging voltage	1. Wiring	
	· Bare wire shorting intermittently under vibration or broken wire making partial contact	Repair or replace
	2. Generator	
	· Layer short (intermittent shorting)	Repair or replace
	3. Generator	
	· Intermittent open circuit in the coil	Repair or replace
	· Improperly adjusted voltage	Readjust
	· Defective key switch	Replace
	· Dirty points	Clean

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Trouble	Probable causes	Remedies
Self discharge Battery discharges in addition to that caused by the connected load.	1. Dirty contact areas and case. 2. Contaminated electrolyte or electrolyte excessively concentrated.	1. Always maintain the exterior clean. 2. Handle the replenishing electrolyte with care.
C. Large discharge rate Specific gravity gradually lowers and around 1.100 (S. G.), the winker and horn no longer function.	1. The fuse and the wiring are satisfactory, but loads such as winker and horn do not function. In this condition the motorcycle will operate but with long use, both ⊕ and ⊖ plates will react with the sulfuric acid and form lead sulfide deposits, (sulfation) making it impossible to recharge.	1. When the specific gravity falls below 1,200 (20°C: 68°F), the battery should be recharged immediately. 2. When the battery frequently becomes discharged while operating at normal speed, check the generator for proper output. 3. If the battery discharges under normal charge output, it is an indication of overloading, remove some of the excess load.
High charging rate The electrolyte level drops rapidly but the charge is always maintained at 100% and the condition appears satisfactory. (Specific gravity over 1.260)	1. The deposit will heavily accumulate at the bottom and will cause internal shorting and damage the battery.	1. Check to assure proper charging rate.
Specific gravity drop Electrolyte evaporates	1. Shorted. 2. Insufficient charging. 3. Distilled water overfilled. 4. Contaminated electrolyte.	1. Check specific gravity measurement. 2. If the addition of distilled water causes a drop in specific gravity, add sulfuric acid and adjust to proper value.
Sulfation The electrode plates are covered with white layer or in spot.	1. Charging rate is too small or else excessively large. 2. The specific gravity or the mixture of the electrolyte is improper. 3. Battery left in a discharge condition for a long period. (left with the switch turned on). 4. Exposed to excessive vibration due to improper insulation. 5. Motorcycle stored during cold season with battery connected.	1. When motorcycle is in storage, the battery should be recharged once a month even though the motorcycle is not used. 2. Check the electrolyte periodically and always maintain the proper level. 3. In a lightly discharged condition, perform recharging and discharging several times by starting the engine may be sufficient.
Spark plug electrode coated with carbon deposit	1. Too rich a fuel. 2. Excessive idle speed. 3. Poor quality gasoline. 4. Clogged air cleaner. 5. Use of cold spark plug.	Adjust carburetor. Adjust idle speed. Use good quality gasoline Service the air cleaner. Use proper heat range plug.
Spark plug electrode fouled with oil	1. Worn piston ring. 2. Worn piston and cylinder. 3. Excessive clearance between valve guide and valve stem.	Replace piston ring. Replace piston or cylinder. Replace valve guide or valve.
Spark plug electrode overheated or burnt	1. Use of hot spark plug. 2. Engine overheating. 3. Improper ignition timing. 4. Loose spark plug or damaged spark plug hole thread. 5. Too lean a fuel mixture.	Use proper heat range plug. Readjust ignition timing. Retighten plug or replace cylinder head. Adjust carburetor.
Damage	Spark plug overtorqued.	Replace with a new spark plug.

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8. PERIODICAL MAINTENANCE

MAINTENANCE SCHEDULE

The following list indicates the items and time interval of preventive maintenance by which the best riding conditions are assured.

The operating procedures for individual items are explained in the section of MAINTENANCE OPERATIONS.

The "months" in the list represents the lapse of months since the purchase of a new motorcycle and the "mileage" is a reading on the odometer.

After 24 months or 12,000 miles (20,000 km), repeatedly perform all items which are described in the column of 6, 12, 18 and 24 months at every 6 months or 3,000 miles (5,000 km) intervals.

The following parts should be severely inspected at the time of 24 months garage service.

* Front brake hose
* Brake cable
* Front brake stop switch
* Brake master cylinder primary and secondary caps
* Brake disc caliper piston seal
* Carburetor rubber caps
* Fuel lines

Months or miles, whichever comes first / Service required		—	6	12	18	24	Page Reference
	Month	—	6	12	18	24	
	Mile Km	600 1,000	3,000 5,000	6,000 10,000	9,000 15,000	12,000 20,000	
Engine							
Change engine oil		○	Every 2,000 Miles (3,000 km)				13
Change oil filter element		○	Every 4,000 Miles (6,000 km)				14
Clean oil screen filter						○	37
Service spark plugs			○	○	○	○	13, 91
Service contact breaker points			○	○	○	○	10
Adjust ignition timing		○	○	○	○	○	10
Check ignition primary and secondary cables				○		○	89
Adjust valve tappet clearances		○	○	○	○	○	7
Adjust cam chain		○	○	○	○	○	12
Service air cleaner			○	○	○	○	16
Adjust carburetors			○	○	○	○	8
Check throttle valve operation			○	○	○	○	10
Clutch							
Adjust clutch		○	○	○	○	○	12
Battery							
Service battery		○	○	○	○	○	16
Fuel system							
Clean fuel valve strainer			○	○	○	○	85
Check fuel tank and fuel lines			○	○	○	○	85

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Months or miles, whichever comes first / Service required	Month	—	6	12	18	24	Page Reference
	Mile Km	600 1, 000	3, 000 5, 000	6, 000 10, 000	9, 000 15, 000	12, 000 20, 000	
Steering and Front Suspension							
Check steering head bearings				○		○	78
Check steering handle lock				○		○	78
Check handle bar holder			○	○	○	○	—
Check front fork top plate			○	○	○	○	—
Check front fork bottom case			○	○	○	○	71
Change front fork oil				○		○	17
Rear suspension							
Grease rear fork			○	○	○	○	83
Check rear fork			○	○	○	○	83
Check rear suspension mounting bolts			○	○	○	○	83
Wheels and Brakes							
Check front and rear wheel spokes		○	○	○	○	○	66
Check front and rear wheel rims and hubs			○	○	○	○	66
Check front and rear wheels, bearings and axles				○		○	67
Check front and rear tires			○	○	○	○	—
Check front brake caliper and pad linings			○	○	○	○	14, 71
Check front brake lines				○		○	14
Check brake fluid level		○	○	○	○	○	14
Check and adjust brake pedal		○	○	○	○	○	15
Check rear brake shoe linings				○		○	75
Check rear brake stopper arm			○	○	○	○	—
Frame and Final Drive							
Check frame			○	○	○	○	—
Check exhaust system			○	○	○	○	—
Check side stand			○	○	○	○	—
Service and adjust final drive chain		○	○	○	○	○	16
Check final drive and driven sprockets				○		○	—
Lights and Accessories							
Check lights and switches			○	○	○	○	—
Check horn			○	○	○	○	—
Check speedometer and tachometer			○	○	○	○	—

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9. TECHNICAL DATA

A. Specifications

	Item	English	Metric	
DIMENSION	Overall Length	83. 0 in.	2, 105 mm	
	Overall Width	32. 5 in.	825 mm	
	Overall Height	44. 0 in.	1, 115 mm	
	Wheel Base	55. 5 in.	1, 405 mm	
	Seat Height	31. 7 in.	805 mm	
	Foot Peg Height	12. 4 in.	315 mm	
	Ground Clearance	6. 5 in.	165 mm	
	Dry Weight	403. 5 lb.	183 kg	
FRAME	Type	Double cradle tubular steel		
	F. Suspension, Travel	Telescopic fork, travel 4. 8 in.,	121 mm	
	R. Suspension, Travel	Swing arm, travel 3. 1 in.,	78. 5 mm	
	F. Tire Size, Type	3. 15–19 (4 PR) Rib tire, tire air pressure 25. 6 psi		1. 8 kg/cm²
	R. Tire Size, Type	3. 50–18 (4 PR) Block tire, tire air pressure 28. 5 psi		2. 0 kg/cm²
	F. Brake, Lining Area	Disc brake, lining area 32. 36 in²×2		288. 8 cm²×2
	R. Brake, Lining Area	Internal expanding shoe, lining area 26. 28 in²×2		169. 6 cm²×2
	Fuel Capacity	3. 7 U.S. gal. 3. 1 Imp. gal.	14. 0 lit.	
	Fuel Reserve Capacity	1. 6 U.S. gal. 0. 9 Imp. gal.	4. 0 lit.	
	Caster Angle	64°		
	Trail Length	4. 1 in.	105 mm	
	Front Fork Oil Capacity	5. 4 ozs	160 cc	
ENGINE	Type	Air-cooled, 4-stroke, O.H.C. engine		
	Cylinder Arrangement	4-cylinder in-line		
	Bore and Stroke	2. 205×1. 992 in.	56. 0×50. 6 mm	
	Displacement	30. 38 cu in.	498 cc	
	Compression Ratio	9. 0		
	Carburetor, Venturi Dia.	Four, piston valve, 22 mm dia.		
	Valve Train	Chain drive overhead camshaft		
	Maximum Horsepower	50 BHP (SAE)/9, 000 rpm		
	Maximum Torque	30. 4 lb-ft/7, 500 rpm	4. 2 kg-m/7, 500 rpm	
	Oil Capacity	3. 2 U.S. qt., 2. 6 Imp. qt	3. 0 lit.	
	Lubrication System	Forced pressure and wet sump		

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	Item	English	Metric
ENGINE	Air Filtration	Paper element	
	Valve Tappet Clearance	IN : 0. 002, EX : 0. 003 in.	IN : 0. 05, EX : 0. 08 mm
	Engine weight	152 lb.	69 kg
	Air Screw Opening	1±1/8 turns	
	Idle Speed	1,000 rpm	
DRIVE TRAIN	Clutch	Wet, multi-plate	
	Transmission	5-speed, constant mesh	
	Primary Reduction	2. 000	
	Gear Ratio I	2. 353	
	〃 II	1. 636	
	〃 III	1. 269	
	〃 IV	1. 036	
	〃 V	0. 900	
	Final Reduction	2. 000, drive sprocket 17, driven sprocket 34 T	
	Gear Shift Pattern	Left foot return type	
ELECTRICAL	Ignition	Battery and ignition coil	
	Starting System	Electrical motor and kick pedal	
	Alternator	Three phase A.C. 12 V-0. 2 KW/5, 000 rpm	
	Battery Capacity	12 V-12 AH	
	Spark Plug	NGK D-7 ES, DENSO X-22 ES	
	Headlight	Low/high, 12 V-40 W/50 W	
	Tail/stoplight	Tail/Stop, 12 V- 7 W/23 W	
	Turn Signal light	Front/Rear 12 V-25 W/25 W	
	Speedometer Light	12 V- 3 W	
	Tachometer Light	12 V- 3 W	
	Neutral Indicator Light	12 V- 3 W	
	Turn Signal Indicator Light	12 V- 3 W	
	High Beam Indicator Light	12 V- 3 W	

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B. Service Data

4. ENGINE

mm (in.)

Item	Standard value	Serviceable limit
Inlet cam height	34.93~34.97 (1.3742~1.3768)	35.85 (1.4075)
Exhaust cam height	34.53~34.57 (1.3595~13.610)	34.45 (1.3563)
Runout	—	0.1 (0.004)

Item	Standard value	Serviceable limit
Cylinder bore	56~56.01 (2.204~2.205)	56.1 (2.208)

Item	Standard value	Serviceable limit
Piston dia.	55.99~55.97 (2.204~2.203)	55.85 (2.198)
Piston pinhole	—	15.08 (0.593)

Item	Standard value	Serviceable limit
Piston ring end gap	0.15~0.35 (0.005~0.013)	0.7 (0.027)

Piston ring Side clearance	Standard value	Serviceable limit
Top ring	0.040~0.075 (0.0015~0.0029)	0.18 (0.007)
Second ring	0.025~0.06 (0.0009~0.0023)	0.15 (0.005)
Oil ring	0.020~0.055 (0.0007~0.0021)	0.15 (0.005)

Item	Standard value	Serviceable limit
Ring groove clearance	15.002~15.008 (0.59063~0.59087)	Replace if over 15.080 (0.5937)

	Standard value	Serviceable limit
Valve stem clearance	Inlet 0.010~0.035 (0.00039~0.00137)	0.080 (0.0031)
	Exhaust 0.030~0.050 (0.0011~0.0019)	0.10 (0.0039)
Valve stem diameter	Inlet 5.450~5.465 (0.2145~0.2150)	
	Exhaust 5.430~5.445 (0.2137~0.2142)	
Valve face runout	—	0.05 (0.009)

mm (in.)

Item	Standard value	Serviceable limit
Cylinder head flatness	—	0.3 (0.011)

Item	Standard value	Serviceable limit
Valve spring free length	Outer 40.4 (1.59)	39 (1.53)
	Inner 35.7 (1.40)	34.5 (1.35)
Loading (reference)	Outer 27.9 mm/45.6~50.6 kg (1.0 in/ 100.54~111.57 lbs-ft)	
	Inner 23.2 mm/19.1~21.1 kg (0.9 in/ 421.15~464.35 lbs-ft)	
Clutch plate warp	—	0.3 (0.011)

Oil pump	Standard value	Serviceable limit
Inner and outer rotor clearance	—	0.35 (0.013)
Outer rotor and body clearance	—	0.35 (0.013)

Item	Standard value	Serviceable limit
Friction disc thickness	3.3 (0.13)	3.0 (0.11)

	Standard value	Serviceable limit
Clutch spring free length	31.9 (1.25)	30.5 (1.20)
Spring strength	31.4~33 kg at 23 mm (227.84~238.6 at 0.90 in)	

Item	Standard value	Serviceable limit
Gear shift drum O.D.	39.975~39.95 (1.5738~1.5728)	39.9 (1.5709)
Shift fork I.D.	40.00~40.025 (1.5748~1.5757)	40.075 (1.5797)

Gear shift fork	Standard value	Serviceable limit
Center	5.93~6.00 (0.233~0.236)	5.60 (0.220)
Right & left	4.93~5.0 (0.194~0.197)	4.60 (0.181)

Item	Standard value	Serviceable limit
Crankshaft journal clearance	0.020~0.046 (0.00079~0.00181)	0.080 (0.0031)
Runout	—	0.05 (0.0019)
Journal and taper	—	0.05 (0.0019)

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Item	Standard value	Serviceable limit
Connecting rod large end clearance	0.02~0.046 (0.00079~0.00181)	0.08 (0.0031)

mm (in.)

Item	Standard value	Serviceable limit
Connecting rod side clearance	0.12~0.27 (0.0047~0.0106)	0.35 (0.0138)

Item	Standard value	Serviceable limit
Connecting rod small end clearance	15.016~15.034 (0.5911~0.5918)	15.07 (0.5930)

Item	Standard value	Serviceable limit
1st, 2nd, 3rd gears backlash	0.044~0.133 (0.0017~0.0051)	0.2 (0.0078)
4th and 5th gears backlash	0.046~0.140 (0.0018~0.0055)	0.2 (0.0078)

5. CHASSIS

Wheel	Standard value	Serviceable limit
Rim wobble	0.5 (0.020)	2.0 (0.08)
Wheel runout	0.5 (0.020)	2.0 (0.08)

Wheel bearing	Standard value	Serviceable limit
Front wheel bearing axial direction, TIR	0.07 (0.028)	0.1 (0.004)
Front wheel bearing radial direction, TIR	0.003 (0.00012)	0.05 (0.002)

Front brake	Standard value	Serviceable limit
Caliper cylinder inside dia.	38.18~38.20 (1.5031~1.5039)	38.215 (1.504)
Caliper piston outside dia.	38.115~38.48 (1.5006~1.5149)	38.105 (1.500)

Front brake	Standard value	Serviceable limit
Master cylinder	14.0~14.043 (0.5511~0.5528)	14.055 (0.533)
Piston	13.957~13.984 (0.5494~0.5505)	13.940 (0.549)

Wheel	Standard value	Serviceable limit
Rim runout, TIR (vertical and side)	0.5 (0.02)	2.0 (0.08)

Item	Standard value	Serviceable limit
Disc trueness	——	0.3 (0.011)
Caliper and piston clearance	——	0.11 (0.004)
Master cylinder and piston clearance	——	0.11 (0.004)

mm (in.)

Rear axle shaft	Standard value	Serviceable limit
Bent, TIR	0.01 (0.0004)	0.2 (0.009)

Brake lining	Standard value	Serviceable limit
Thickness	5.0 (0.200)	2.0 (0.080)

Brake Drum	Standard value	Serviceable limit
Inside dia.	179.8~180.0 (7.079~7.087)	181.0 (7.125)

Item	Standard value	Serviceable limit
Axial, TIR	0.07 (0.0028)	0.1 (0.004)
Radial, TIR	0.003 (0.00011)	0.05 (0.002)

	Standard value	Serviceable limit
Front suspension spring I.D.	42 (1.65)	
Free length	451.7 (17.78)	425 (16.73)
Tilt	5 (0.02)	8 (0.03)

Item	Standard value	Serviceable limit
Rear suspension free length	210.4 (8.283)	205 (8.070)

Item	Standard value	Serviceable limit
Clearance	0.1~0.3 (0.004~0.012)	0.5 (0.02)
Rear fork bushing inside dia.	21.448~21.5 (0.844~0.846)	21.8 (0.858)
Center collar outside dia.	21.427~21.46 (0.843~0.844)	21.4 (0.842)

6. ELECTRICAL

Item	Standard value	Serviceable limit
Carbon brush length	12~31 mm (0.47~0.51 in)	5.5 mm (0.22 in)
Brush spring tension	0.5~0.5 kg (1.1~1.3 lbs)	0.4 kg (0.8 lbs)

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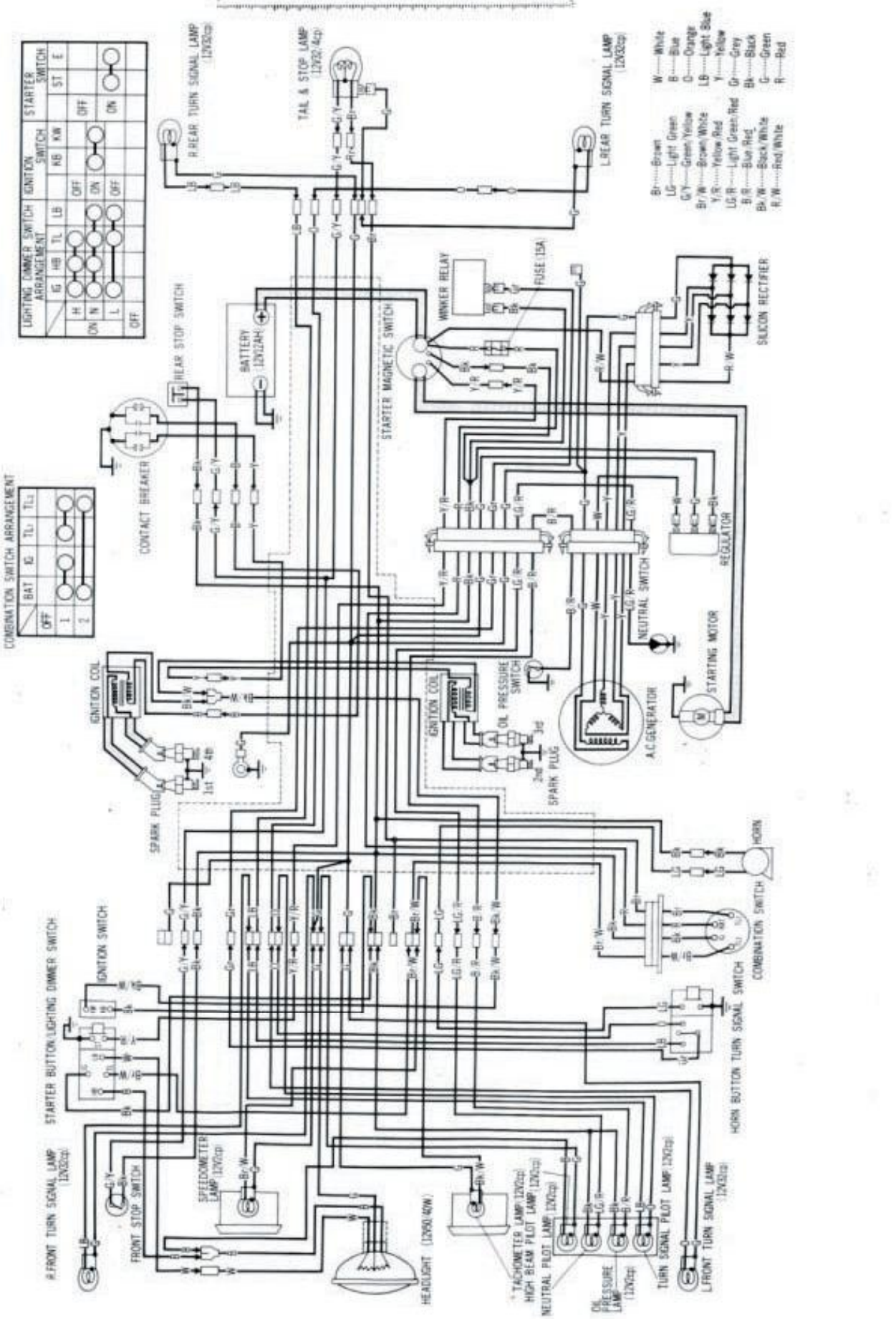
10. WIRING DIAGRAM



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